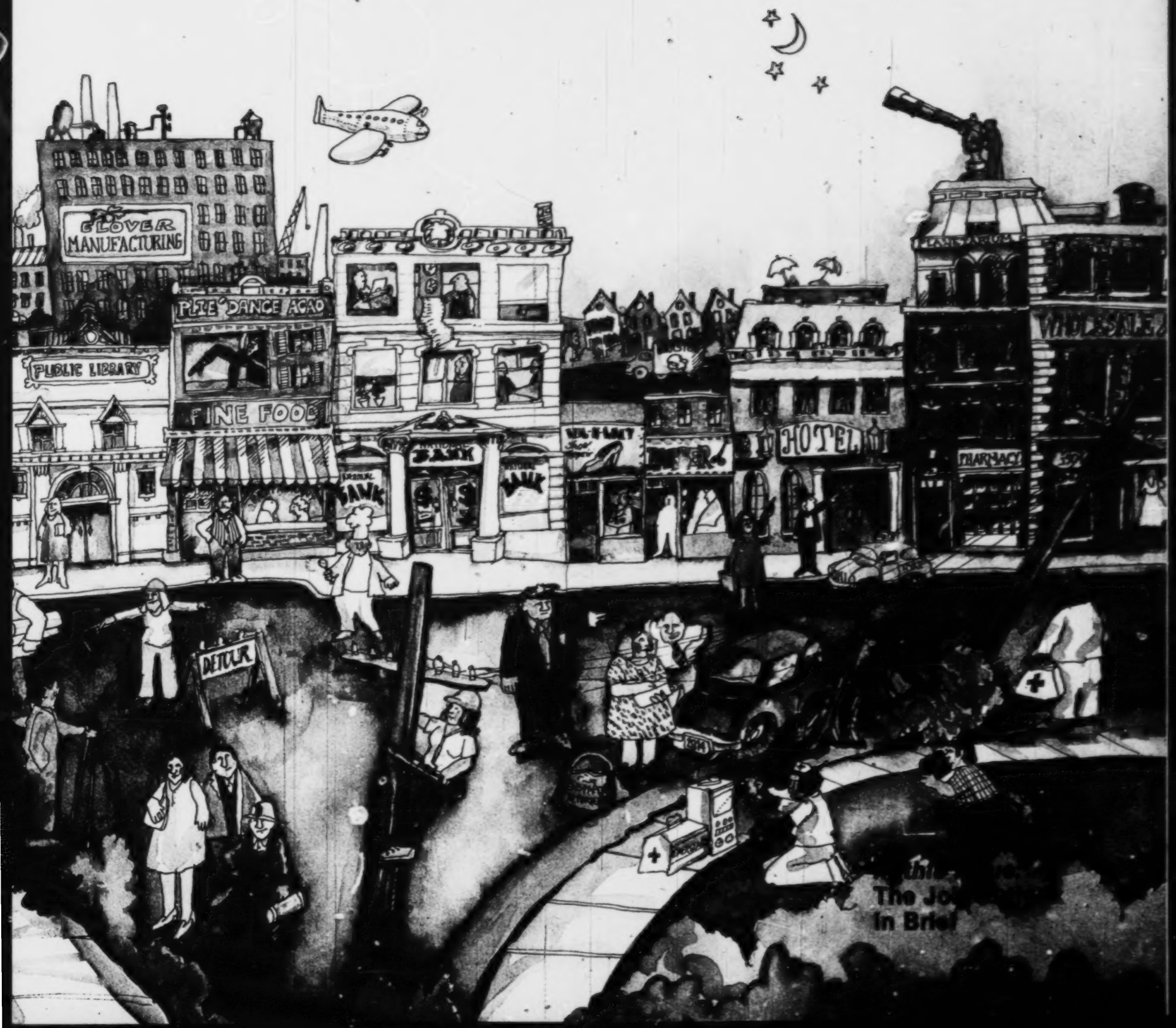
Occupational Outlook Quarterly

U.S. Department of Labor
Bureau of Labor Statistics
Spring 1980



The Jo
In Brief

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Stationary engineers	179,000	7,700	Employment expected to change little because of trend to more powerful and more centralized equipment.
Waste water treatment plant operators (sewage plant operators)	112,000	(2)	Employment expected to grow much faster than average as new treatment plants are built and existing ones are expanded to cope more effectively with water pollution.
Welders	679,000	35,000	Employment expected to grow faster than average due to expansion of metalworking industries. Very good opportunities except during economic downturns.

OFFICE OCCUPATIONS

Clerical occupations

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Bookkeeping workers	1,830,000	96,000	Employment expected to grow more slowly than average due to increasing use of bookkeeping machines and computers. Due to high replacement needs, job opportunities are expected to be numerous.
Cashiers	1,403,000	119,000	Plentiful job opportunities expected as employment grows faster than average and replacement needs remain high. However, widespread adoption of automatic checkout systems could slow future growth.
Collection workers	78,000	4,600	Employment expected to grow about as fast as average as an increasing use of credit results in a greater number of delinquent accounts. Good job opportunities for aggressive and personable people, particularly in collection agencies and retail trade firms.
File clerks	273,000	16,500	Employment expected to grow about as fast as average as business expansion creates a need for more and better recordkeeping. Jobseekers with typing and other office skills should have the best opportunities.
Hotel front office clerks	79,000	5,400	Employment expected to grow as fast as average. The use of computerized reservation systems may limit growth.
Office machine operators	160,000	9,700	Employment expected to grow about as fast as average. The spread of centralized and computerized recordkeeping and processing systems will limit growth somewhat. Most openings will result from replacement needs.
Postal Clerks	260,000	2,000	Employment expected to decline due increasing automation of mail processing.
Receptionists	588,000	41,000	Employment expected to grow faster than average as business, personal, and professional services expand. Some opportunities for part-time work.
Secretaries and stenographers	3,684,000	305,000	Skilled persons seeking secretarial positions should find numerous opportunities. Part-time secretarial jobs should also remain plentiful. Use of dictation machines will continue to limit demand for stenographers.
Shipping and receiving clerks	461,000	22,000	Employment expected to rise about as fast as average as business expansion results in a greater volume of goods to be distributed. Use of computers to store and retrieve shipment records may limit growth somewhat.
Statistical clerks	377,000	23,500	Employment expected to grow faster than average as need for collection and processing of data increases. Knowledge of computers may be helpful for some jobs.
Stock clerks	507,000	23,000	Employment expected to increase about as fast as average. Use of computers to manage storage space and automated equipment to move stock may limit growth somewhat.
Typists	1,044,000	59,000	Good opportunities expected as business expansion increases the amount of paperwork and replacement needs remain high. Demand particularly strong for typists who can handle a variety of office duties and operate word processing equipment.

Computer and related occupations

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Computer operating personnel	666,000	12,500	Employment of console and peripheral equipment operators expected to rise about as fast as average as use of computers expands. Employment of keypunch operators expected to decline, however, due to more efficient direct data entry techniques.
Programmers	247,000	9,200	Employment expected to grow faster than average as computer usage expands, particularly in accounting, business management, and research and development. Brightest prospects for college graduates with degree in computer science or related field.

Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Systems analysts	182,000	7,900	Employment expected to grow faster than average as computer capabilities are increased and computers are used to solve a greater variety of problems. Excellent prospects for graduates of computer-related curriculums.
Banking occupations			
Bank clerks	505,000	45,000	Employment expected to grow much faster than average as banking services expand. Job opportunities should be good, especially for persons trained to operate peripheral computer equipment.
Bank officers and managers	330,000	28,000	Employment expected to grow faster than average as expansion of bank services and increasing dependence on computers adds to the need for officers and managers. Good opportunities for college graduates as management trainees.
Bank tellers	410,000	17,000	Employment expected to grow more slowly than average. High replacement needs and expansion of bank services should create good opportunities for jobs.
Insurance occupations			
Actuaries	9,000	500	Employment expected to rise faster than average as insurance sales increase. However, a large number of qualified applicants are likely to create keen competition for jobs.
Claim representatives	169,000	10,250	Employment expected to grow faster than average due to increasing insurance claims.
Underwriters, insurance agents, and brokers	568,000	30,000	Employment expected to grow about as fast as average as insurance sales continue to expand. Favorable opportunities for agents and brokers who are ambitious and enjoy saleswork.
Administrative and related occupations			
Accountants	985,000	61,000	Employment expected to increase faster than average as managers rely more on accounting information to make business decisions. College graduates will be in greater demand than applicants who lack this training.
Buyers	115,000	7,400	Employment expected to grow about as fast as average. But keen competition anticipated because merchandising attracts large numbers of college graduates.
City managers	3,300	350	Employment expected to grow much faster than average. Competition will be keen, however, even for persons with graduate degrees in public administration.
College student personnel workers	55,000	(2)	Competition for jobs expected as tighter budgets in public and private colleges and universities limit employment growth. Best opportunities in junior and community colleges.
Credit managers	49,000	2,200	Employment expected to grow more slowly than average as use of computers and telecommunications equipment allows centralization of credit offices.
Hotel managers and assistants	168,000	8,900	Employment expected to grow more slowly than average. Best opportunities for persons with degrees in hotel administration.
Lawyers	487,000	37,000	Employment expected to grow faster than average in response to increased population, business activity, and government regulation. But keen competition likely for salaried positions. Best prospects for establishing new practices will be in small towns and expanding suburbs, although starting a practice will remain a risky and expensive venture.
Marketing research workers	24,000	(2)	Employment expected to grow much faster than average as demand for new products stimulates marketing activities. Best opportunities for applicants with graduate training in marketing research or statistics.
Personnel and labor relations workers	405,000	17,000	Employment expected to grow faster than average as new standards for employment practices in areas of occupational safety and health, equal employment opportunity, and pensions stimulate demand. Best opportunities with State and local governments.
Purchasing agents	185,000	13,400	Employment expected to increase faster than average as businesses try to reduce purchasing costs. Excellent job opportunities, especially for persons with a master's degree in business administration.
Urban and regional planners	17,000	800	Employment expected to grow faster than average. Oversupply of graduates may cause competition for jobs.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Medical laboratory workers	210,000	14,800	Employment expected to grow faster than average as physicians make more use of laboratory facilities. Job opportunities should be favorable.
Medical records technicians and clerks	50,000	4,900	Employment expected to grow faster than average as the number of health insurance, Medicare, and Medicaid claims increases the need for more complete medical records. Excellent opportunities for those with specialized training.
Operating room technicians	35,000	2,600	Employment expected to increase faster than average as technicians assume more of the routine nursing tasks in operating rooms. Graduates of postsecondary school training programs will have the best job opportunities.
Optometric assistants	15,000	1,200	Employment expected to grow faster than averge as demand for eye care services increases and more optometrists hire assistants. Excellent opportunities for persons who have completed postsecondary school training.
Radiologic (X-ray) technologists	100,000	9,000	Employment expected to expand faster than average as X-ray equipment is increasingly used to diagnose and treat diseases. But applicants may face competition for jobs.
Respiratory therapy workers	50,000	5,000	Employment expected to grow much faster than average due to new applications of respiratory therapy in treating diseases. Job opportunities should be excellent for graduates of accredited programs.
Nursing occupations			
Registered nurses	1,060,000	85,000	Employment expected to grow faster than average. Favorable opportunities, especially in some southern States and many inner-city locations. Nurses may find competition for higher paying jobs and for jobs in some urban areas with large training facilities.
Licensed practical nurses	518,000	60,000	Employment expected to grow much faster than average as population increases and demand for health care rises. Job prospects are very good.
Nursing aides, orderlies, and attendants	1,037,000	94,000	Employment expected to grow much faster than average due to increased demand for medical care. Most job openings will be in nursing homes, convalescent homes, and other long-term care facilities.
Therapy and rehabilitation occupations			
Occupational therapists	15,000	2,500	Employment expected to grow much faster than average due to public interest in rehabilitation of disabled persons and growth of established occupational therapy program. Job prospects should be favorable.
Occupational therapy assistants	10,000	1,100	Employment expected to grow much faster than average due to increased need for assistants in health care institutions. Opportunities should be very good, especially for graduates of approved programs.
Physical therapists	30,000	2,700	Employment expected to grow *much faster than average because* of increased public recognition of importance of rehabilitation. Employment opportunities should be best in suburban and rural areas.
Physical therapist assistants and aides	12,500	400	Employment expected to increase about as fast as average. Jobseekers may face competition for best positions. Assistants should have better employment prospects than aides.
Speech pathologists and audiologists	32,000	3,900	Employment expected to increase much faster than average due to growing public concern over speech and hearing disorders. Persons with only a bachelor's degree will face considerable competition for jobs.
Other health occupations			
Dietitians	35,000	3,300	Employment expected to grow faster than average in response to increasing concern for proper nutrition and food management. Favorable full- and part-time opportunities for those with a bachelor's degree and persons with specialized training.
Dispensing opticians	17,600	1,200	Employment expected to increase faster than average as demand for eyeglasses rises. Opportunities should be excellent for persons with an associate degree in opticianry.
Health service administrators	180,000	18,000	Employment expected to grow much faster than average as quantity of patient services increases and health services management becomes more complex. Advanced degree required for best positions in hospitals.
Medical record administrators	12,500	900	Employment expected to grow as fast as average due to increasing use of health facilities. Good opportunities for graduates of approved programs.

Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Pharmacists	135,000	7,800	Employment expected to grow faster than average due to establishment of new pharmacies and increasing use of pharmacists in health care institutions. Applicants may face competition for jobs.
SOCIAL SCIENTISTS			
Anthropologist	7,000	350	Employment expected to increase about as fast as average. Nearly all new jobs will be in nonacademic areas. Even persons with a Ph.D in anthropology can expect keen competition for jobs.
Economists	130,000	7,800	Employment expected to grow faster than average. Master's and Ph.D. degree holders may face keen competition for academic positions but can expect good opportunities in nonacademic areas, particularly for those trained in quantitative methods. Persons with bachelor's degrees likely to face keen competition.
Geographers	10,000	500	Employment expected to grow about as fast as average. Advanced degree holders likely to face keen competition for academic positions, but good prospects in nonacademic areas. Bachelor's degree holders will face competition.
Historians	23,000	700	Little change in employment expected. Keen competition anticipated, particularly for academic positions. Best opportunities for Ph.D.'s with a strong background in quantitative research methods.
Political scientists	14,000	500	Employment expected to increase more slowly than average. Keen competition likely, especially for academic positions. Best opportunities for advanced degree holders with training in applied fields such as public administration or public policy.
Psychologists	130,000	6,700	Employment expected to grow faster than average. Graduates face increasing competition, particularly for academic positions. Best prospects for doctoral degree holders trained in applied areas, such as clinical, counseling, and industrial psychology.
Sociologists	19,000	600	Employment expected to grow more slowly than average. Ph.D.'s may face competition, particularly for academic positions. Best opportunities for Ph.D.'s trained in quantitative research techniques. Very keen competition below Ph.D. level.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
SOCIAL SERVICE OCCUPATIONS			
Counseling occupations			
School counselors	45,000	1,700	Employment expected to grow more slowly than average as declining school enrollment coupled with financial constraints limit growth.
Employment counselors	6,100	(2)	Employment growth is highly dependent on the level of Federal and State funding. Applicants are expected to face some competition in both public and private employment agencies.
Rehabilitation counselors	19,000	(2)	Employment growth dependent upon government funding for rehabilitation agencies. Some openings expected with insurance and other private companies to help in equal employment opportunity efforts.
College career planning and placement counselors	5,000	(2)	Little change expected in employment although some growth may occur in community and junior colleges where there are no career planning and placement programs at present. Keen competition likely for jobs.
Clergy			
Protestant ministers	190,000	(2)	Competition is expected for positions in individual congregations. Some ministers will find work in youth, family relations, and welfare programs and as chaplains in hospitals, universities, or the Armed Forces.
Rabbis	4,000	(2)	Reform rabbis may face some competition for available positions, and Orthodox clergy expected to encounter very keen competition. Rabbis from the Conservative branch of Judaism should have good opportunities.
Roman Catholic priests	58,000	(2)	Growing number of priests needed as supply of seminary graduates fails to keep pace with increasing Catholic population.
Other social service occupations			
Cooperative extension service workers	16,000	650	Employment expected to increase more slowly than average. Need for persons who can relay advances in farming practices from researchers to farmers will lead to some growth.
Homemaker-home health aides	110,000	36,000	Employment expected to grow much faster than average as public awareness of the availability of home care services increases.

oping an interest test that career counselors can use to gain access to the *Guide.* The USES Interest Inventory, which will be available to Job Service offices this year, will help the career counselor relate one or more of the broad areas of highest occupational interest to the person being counseled. The USES General Aptitude Test Battery (GATB), in use since 1947, can help identify the specific work groups in which a job applicant shows aptitude."

The new USES Interest Inventory test is part of the system designed to measure the jobseeker's career interests. This test should help make the present assessment process more efficient and systematic. Three types of factors are included in the inventory:

- Job activity statements, such as, "serves meals in a restaurant;"
- Occupational titles, such as "typist;"
- Life experiences, such as "reading a bus schedule" and "taking walks in the parks."

The jobseeker responds by indicating his or her personal like or dislike for each statement. Response are scored by counting the number of items checked "like." Since these interests fall into the broad areas defined in the *Guide,* the test enables the counselor to help the jobseeker identify those areas in the *Guide* in which he or she is most interested in exploring career possibilities.

The new USES Interest Checklist is an alternative tool for exploring occupational interests in terms of preferences for activities in the various work groups listed in the *Guide* under the 12 broad interest areas. The test consists of 210 work activities selected to reflect a sampling of jobs found in the *Guide's* 66 work groups. No score is obtained, but the counselor notes the concentration of checks indicating a liking for activities in some work groups and discusses them with the jobseeker. Then the jobseeker is invited to explore in depth the work groups in the *Guide* in which occupational interests seem to be concentrated.

The USES General Aptitude Test Battery (GATB) measures 9 occupational aptitudes and takes about 2½ hours to administer. It has been used by Job Service counselors sine 1947 to measure occupational aptitudes against the requirements of several hundred occupations. But now, new research has made it possible to relate an individual's aptitude scores to the requirements of over 95 percent of the nonsupervisory occupations in the United States. The product of this research consists of a structure of occupational aptitude patterns tied directly to most of the work groups in the *Guide.* Therefore, a jobseeker's GATB aptitude scores now can be compared to the aptitude requirements of 59 of the 66 work groups in the *Guide* to determine the ones for which the jobseeker has sufficient aptitude to perform satisfactorily.

It is therefore apparent that the *Guide* and the new interest and aptitude tests will make occupational counseling for jobseekers much more complete. Once the jobseeker's major interests and aptitudes have been identified, it will be possible, through a simple matching process, to identify the work groups which the jobseeker should explore further to identify specific jobs. This exploration can readily be done by following the simple procedure described in the *Guide.*

Drafts of the *Guide* were provided to Job Service and secondary school counselors and others in vocational guidance including consultants and librarians. The consensus is that the *Guide* is adaptable to a broad spectrum of counseling situations. Both counselors and jobseekers can be helped to achieve what both seek—a workable method for exploring career possibilities in terms of the individual's interest and aptitudes.

The *Guide for Occupational Exploration* is available from the Government Printing Office, Washington, D.C. 20402. Stock no. 092-013-00080-2; price: $11.

"Unlike most career education materials which match interest factors to a limited number of occupations, the* Guide *truly expands student horizons. Users can begin from a broad interest area or specific career field. The* Guide *is essential because it relates to all the occupations for which one can seek employment. It is organized for easy exploration by students and counselors."

Tom Christofferson, Guidance Counselor
Los Alamos, New Mexico

CAREER DISCOVERY

Career Education for Design Occupations

by Carol Kort

Ask a dozen people about the history of their careers and their responses will probably reveal more about the workings of chance than about the effectiveness of conscious career planning and choice. But preparing for careers today is expensive, and a wrong choice can lead to years of frustration.

What if high school seniors—or people of any age for that matter—could spend a summer trying on a career for size *before* they make a decision leading to years of expensive study? And what if they could not only hear about but experience what an architect does during the pressured charette; what a planner feels when presenting a recommendation to an unsympathetic committee; or how a landscape architect balances ecological factors with a design?

This is the alternative offered by Career Discovery, an unusual 6-week summer program at the Harvard Graduate School of Design Continuing Education Program in Cambridge, Massachusetts. Similar programs exist at Cornell, Carnegie Mellon, Kansas State, Columbia, Syraurse, Notre Dame, and the N.Y. Institute for Architecture & Urban Studies, although none offers the scope of Career Discovery. Career Discovery is a means of exploring a profession through an introduction to the training and practice of architecture, city and regional planning, and landscape architecture. Now in its seventh year, Career Discovery has over 900 graduates who have completed the program with a greater understanding of both their own capacities and the realities of a design or planning career.

On the surface, Career Discovery resembles a regular program in a school of design. Students attend lectures, solve studio problems, take field trips, agonize over formal reviews, and interact with each other. They are also encouraged to learn as much as possible from visiting lecturers, most of whom are practicing designers or planners. These professionals are forewarned that the students want to know about their careers in general, as well as specific projects. Students are just as likely to ask about salaries and the effect of travel on marriage as about aesthetics or technology.

No grades are given and no credit is awarded for Career Discovery, so students are more free to consider the pros and cons of a profession than they would be in a regular summer school. Because Career Discovery is compressed into a month-and-a-half of virtually continuous motion, the experience takes on the characteristics of a language immersion school or an Outward Bound program. Within a few days of learning the jargon, the Career Discovery architecture students start boasting of "last night's charette" and "today's desk crit."

Because Career Discovery is offered without academic credit, the admission procedure is relatively uncomplicated. Acceptance is based not upon specific preparation in design but rather on evidence—an essay—that the students has pursued some personal interest to the point of accomplishment or pride. This policy encourages many people who would be too intimidated by a more rigorous procedure involving transcripts and protfolio examination to give their prospective career a try. The program is open to high school seniors, college students, and adults who are considering a new career. The age of participants typically ranges from 16 to 45. The cost is $650. Scholarship money is available thanks to a generous grant from the National Endowment for the Arts. For more information, please call Carol Kort, 617-495-2578, or write to the Career Discovery Program, Harvard Graduate School of Design, Cambridge, MA 02138.

How successful is the program? Comments by a couple of former students give a clue. One said, "Career Discovery answered any questions I had about becoming an architect. Definitely not!" The other remarked, "Now that I've been through the program, what is my vision of what architects do? Design, design, design, persist, persist, draw, draw, forever and ever. Hassle with contractors and with clients about plans. I love it!" Both responses show that, at least for these students, the six-weeks were well spent.

Carol Kort is the Director of Public Information, Special Programs, Harvard Graduate School of Design.

U.S. Department of Labor
Bureau of Labor Statistics
Washington D.C. 20212

Official Business
Penalty for private use, $300
RETURN POSTAGE GUARANTEED

Postage and Fees Paid
U.S. Department of Labor
Lab-441

SECOND CLASS MAIL

U.S.MAIL

OOQ SERIA300SAISSDUE000R 1
SERIALS PROCESSING
UNIVERSITY MICROFILMS INTL
300 N ZEEB RD
ANN ARBOR MI 48106

U.S. DEPARTMENT OF LABOR
RAY MARSHALL, SECRETARY

Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The *Occupational Outlook Quarterly* is published four times per year, $6 domestic, $7.50 foreign, $1.75 single issue, by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Riverdale, Md. (USPS 492-690). POSTMASTER: Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SUBSCRIPTIONS AND SALES ARE MANAGED BY THE U.S. GOVERNMENT PRINTING OFFICE. Correspondence regarding subscriptions should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Prices are subject to change by the U.S. Government Printing Office.

EDITOR'S NOTE: Articles contributed by authors outside of the U.S. Department of Labor do not necessarily represent the views of the Department. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 523-1386.

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 30, 1984.

BUREAU OF LABOR STATISTICS REGIONAL OFFICES

Boston
1603 JFK Federal Bldg.
Boston, Mass. 02203
Phone: (617) 223-6727

New York
Suite 3400
1515 Broadway
New York, N.Y. 10036
Phone: (212) 399-5405

Philadelphia
P.O. Box 13309
Philadelphia, Pa. 19101
Phone: (215) 596-1154

Atlanta
1371 Peachtree St. NE.
Atlanta, Ga. 30309
Phone: (404) 881-4418

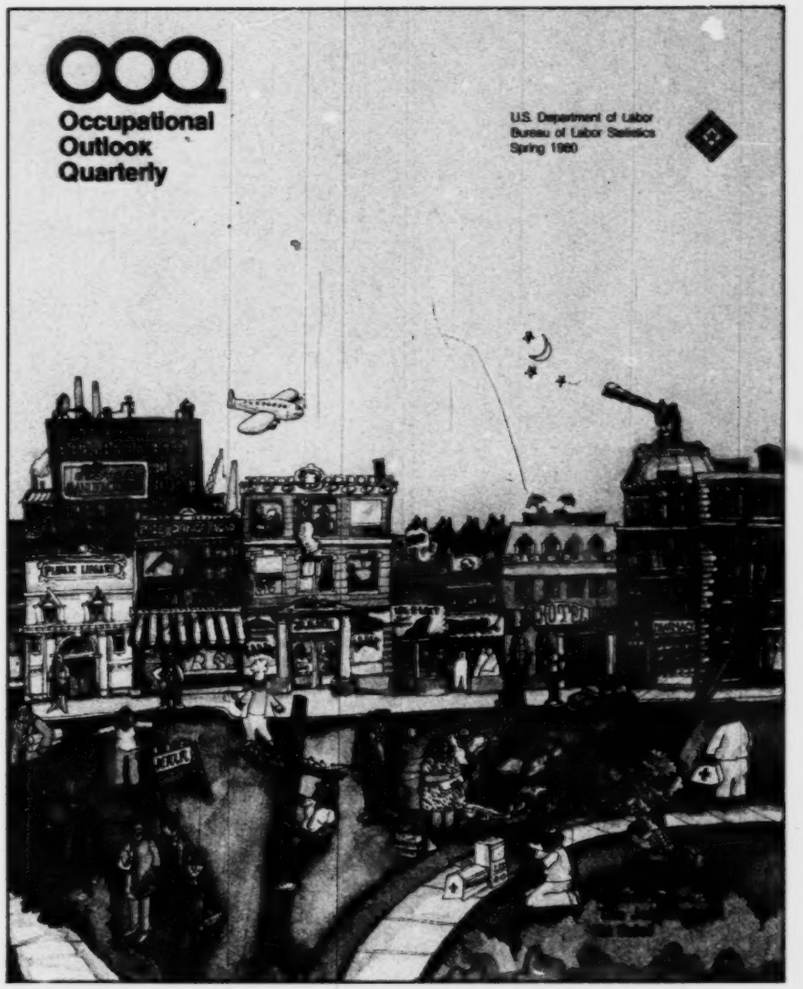
Chicago
9th Floor, Federal Office Bldg.
230 South Dearborn St.
Chicago, Ill. 60604
Phone: (312) 353-1880

Dallas
2nd Floor, 555 Griffin Square Bldg.
Dallas, Tex. 75202
Phone: (214) 767-6971

Kansas City
911 Walnut St.
Kansas City, Mo. 64106
Phone: (816) 374-2378

San Francisco
450 Golden Gate Ave., Box 36017
San Francisco, Calif. 94102
Phone: (415) 556-4678

Cover illustration by
Susan R. Eason



Occupational
Outlook
Quarterly

Melvin C. Fountain, *editor*

Neale Baxter, *managing editor*
Gail M. Martin, *staff writer*

SPRING 1980 **VOLUME 24, NUMBER 1**

The Job Outlook in Brief, Based on the *Occupational Outlook Handbook, 1980-81 Edition* Thomas Nardone **2**

Service and white-collar jobs will set the pace for increasing employment between now and 1990, according to these new projections by the Bureau of Labor Statistics. This rundown on the outlook for more than 250 occupations also includes information on the number employed in each occupation in 1978 and the average number of openings projected for each year.

Index to the "Brief" **21**

Presenting *Exploring Careers* Anne Kahl **22**
Guide for Occupational Exploration Michael J. Walker **26**

These articles discuss two new books that approach the same subject from different directions. *Exploring Careers* is designed to show students in junior high school what it's like to be a worker in various occupations. The *Guide,* to be used by counselors and individuals, matches up personal preferences with thousands of different jobs.

Career Discovery: Career Education for Design Occupations Carol Kort **29**

The theory behind this program is that if reading about a career is good, working at it is even better.

Grab Bag **30**

Counseling Aids **32**

You're a What? Enologist **34**

We'll give you a hint: *Oinos* is Greek for *wine.*

Employers Must Comply With Child Labor Laws Betty Hayes **36**

And the laws they must comply with are described herein.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
SERVICE OCCUPATIONS			
Cleaning and related occupations			
Building custodians	2,251,000	180,000	Employment expected to grow about as fast as average as rising number of office buildings, hospitals, and apartment houses increases demand for maintenance services. Good opportunities for full-time, part-time and evening work.
Hotel housekeepers and assistants	20,000	2,000	Employment expected to grow faster than average. Best opportunities in newly built hotels and motels.
Pest controllers	31,500	2,500	Employment expected to grow faster than average in effort to control rapidly reproducing pest population.
Food service occupations			
Bartenders	282,000	21,600	Employment expected to increase faster than average as many new restaurants, hotels, and bars open.
Cooks and chefs	1,186,000	86,000	Employment expected to increase faster than average as population grows and people spend more money on dining out. Most starting jobs available in small restaurants, school cafeterias, and other eating places where food preparation is simple.
Dining room attendants and dishwashers	455,000	37,000	Plentiful job openings expected due to high turnover and substantial employment growth. Many opportunities for students in part-time jobs.
Food counter workers	463,000	34,000	Employment expected to grow faster than average due to increasing business in eating places. Job openings will be plentiful.
Meatcutters	204,000	5,200	Employment expected to decline because of practice of cutting and wrapping meat for several stores at one location.
Waiters and waitresses	1,383,000	70,000	Employment expected to grow about as fast as average as restaurant business increases. Job openings should be plentiful.
Personal service occupations			
Barbers	121,000	9,700	Employment expected to grow about as fast as average due to increasing demand for barbershop services. Better opportunities for hairstylists than for conventional barbers.
Bellhops and bell captains	20,000	600	Employment is expected to decline because of increasing popularity of economy motels. Best opportunities in motels, small hotels, and resort areas open only part of the year.
Cosmetologists	542,000	28,500	Employment expected to grow about as fast as average in response to rising demand for beauty shop services. Keen competition for jobs is likely.
Funeral directors and embalmers	45,000	2,200	Little employment change expected since existing funeral homes and their employees should be able to meet any additional demand for funeral services.
Private household service occupations			
Private household workers	1,162,000	45,000	Despite expected decline in employment, job opportunities will be plentiful.
Protective and related service occupations			
Correction officers	110,000	13,000	Employment expected to increase faster than average as correctional facilities expand and the number of persons in them increases. Also, replacement needs will create a substantial number of job openings.
FBI special agents	8,000	(2)	Employment expected to rise as FBI responsibilities grow. Few replacement needs because of low turnover rate.
Firefighters	220,000	7,500	Employment expected to increase about as fast as average as need for fire protection grows and professionals replace volunteers. Keen competition for jobs in urban areas; better opportunities in smaller communities.
Guards	550,000	70,000	Employment expected to grow faster than average due to increased concern over crime and vandalism. Best opportunities in guard and security agencies and in night-shift jobs.
Police officers	450,000	16,500	Employment expected to rise about as fast as average as law enforcement needs increase. Keen competition expected with best prospects for applicants with some college training in law enforcement.
State police officers	47,000	1,800	Employment expected to grow faster than average primarily due to demand for officers to work in highway patrol.

Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Construction inspectors (government)	20,000	2,200	Employment expected to grow faster than average as concern about safe construction of new housing and commercial buildings increases. Best opportunities for college graduates and persons experienced as carpenters, electricians, or plumbers.
Health and regulatory inspectors (government)	100,000	5,800	Employment expected to grow about as fast as average as a result of public concern for quality and safety of consumer products.
Occupational safety and health workers	80,000	(2)	Employment expected to grow faster than average as new safety and health programs are started and existing ones upgraded and expanded. Best prospects for graduates of curriculums related to occupational safety and health.
Other service occupations			
Mail carriers	245,000	7,000	Employment expected to increase more slowly than average due to anticipated cutbacks in frequency of mail deliveries. Many openings will result due to replacement needs.
Telephone operators	311,000	9,900	Employment expected to decline due to increased direct dialing and technological improvements. Many openings will result from replacement needs.
EDUCATION AND RELATED OCCUPATIONS			
Teaching occupations			
Kindergarten and elementary school teachers	1,322,000	86,000	Although employment is expected to grow about as fast as average, applicants may face competition for jobs. The number of people qualified to teach is expected to approximate the number of openings.
Secondary school teachers	1,087,000	7,200	Keen competition expected due to declining enrollment coupled with large increases in supply of teachers. More favorable opportunities will exist for persons qualified to teach special education, vocational subjects, mathematics, and the natural and physical sciences.
College and university faculty	673,000[3]	11,000	Employment expected to decline due to decreasing enrollments and budgetary constraints. Keen competition among doctoral and master's degree holders.
Teachers aides	342,000	26,000	Employment expected to rise much faster than average as more aides are hired to lessen teachers' clerical duties.
Library occupations			
Librarians	142,000	8,000	Employment expected to grow more slowly than average. Keen competition for jobs is likely. Best opportunities for librarians with a scientific or technical background.
Library technicians and assistants	172,000	7,700	Employment expected to grow more slowly than average. Public and college and university libraries will offer the best job opportunities.
SALES OCCUPATIONS			
Automobile parts counter workers	97,000	4,200	Employment expected to grow about as fast as average due to increasing demand for new accessories and replacement parts.
Automobile sales workers	158,000	10,400	Employment expected to grow faster than average as demand for automobiles increases. Job openings may fluctuate, however, because sales are affected by changing economic conditions.
Automobile service advisors	25,000	1,100	Employment expected to grow about as fast as average as automobiles increase in number and complexity. Most job openings in large dealerships in heavily populated areas.
Gasoline service station attendants	340,000	5,200	Employment expected to decline because of anticipated slow growth of gasoline consumption and the trend to self-service stations. Many job openings will result from replacement needs.
Manufacturers sales workers	402,000	21,700	Employment expected to grow about as fast as average. Good opportunities for persons with product knowledge and sales ability.
Models	60,000	(2)	Employment expected to increase due to rising advertising expenditures and greater sales of clothing and accessories. Nevertheless, because the glamour of modeling attracts many persons, competition for openings should be keen.
Real estate agents and brokers	555,000	50,000	Employment expected to rise about as fast as average in response to growing demand for housing and other properties. However, field is highly competitive. Best prospects for college graduates and transfers from other sales jobs.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Social service aides	134,000	7,500	Employment expected to grow about as fast as average as social welfare programs expand and aides perform tasks formerly handled by professional personnel. Many opportunities for part-time work.
Social workers	385,000	22,000	Employment expected to increase about as fast as average due to expansion of health services, services for the elderly, and counseling services. Best opportunities for graduates of master's and Ph.D. degree programs in social work.

ART, DESIGN, AND COMMUNICATIONS-RELATED OCCUPATIONS

Performing artists

Actors and Actresses	13,400	850	Employment expected to grow faster than average, but overcrowding in this field will persist. Persons finding jobs may be limited to part-time work only.
Dancers	8,000	550	Although employment expected to grow about as fast as average, applicants are likely to face keen competition for jobs.
Musicians	127,000	8,900	Although employment expected to grow faster than average, job competition will be keen.
Singers	22,000	1,600	Although employment growth is expected to be faster than average, competition for long-term jobs likely to be keen. Some opportunities for part-time and short-term jobs.

Design Occupations

Architects	54,000	4,000	Employment expected to rise faster than average, but competition for jobs likely.
Display workers	44,000	3,300	Employment expected to grow faster than average because of the popularity of visual merchandising, the use of merchandise to decorate stores.
Floral designers	56,000	4,200	Expected increases in sales of flowers and floral arrangements will cause employment to grow faster than average. Job openings are sensitive to economic conditions.
Industrial designers	13,000	550	Employment expected to grow about as fast as average due to an increasing number of products and an emphasis on product safety.
Interior designers	79,000	3,600	Increasing use of design services in business establishments and homes expected to cause employment to grow about as fast as average. Competition for jobs likely, however. Best opportunities for talented college graduates in interior design and graduates of professional interior design schools.
Landscape architects	14,000	1,100	Employment expected to grow faster than average due to increases in new construction and city and regional environmental planning. Job openings are sensitive to economic conditions.
Photographers	93,000	3,800	Employment expected to grow about as fast as average. Portrait and commercial photographers likely to face keen competition. Good opportunities in areas such as law enforcement and scientific and medical research photography.

Communications-related occupations

Newspaper reporters	45,000	2,400	Employment expected to grow about as fast as average. Best opportunities on newspapers in small towns and suburbs and for graduates who have specialized in news-editorial studies and completed a newspaper internship.
Public relations workers	131,000	7,500	Employment expected to grow about as fast as average as corporations, associations, and other large organizations expand public relations efforts to gain public support. Competition for jobs likely to be keen during economic downturns.
Radio and television announcers	27,000	850	Employment expected to increase about as fast as average as new stations are licensed and as cable television stations do more of their own programming. Keen competition likely for openings, however. Best prospects in small cities.
Technical writers	24,000	(2)	Employment expected to grow about as fast as average due to need for effective communication of scientific and technical information in areas such as computer science and electronics. Best opportunities for persons with both writing ability and scientific or technical background.

Notes are on page 21.

Notes to "The Brief"

[1]Due to growth and replacement needs. Does not include transfers out of occupations. Estimates of replacement openings on working life tables developed by Bureau of Labor Statistics.

[2]Estimate not available.

[3]Excludes part-time junior instructors.

[4]For the Nation as a whole, projected decrease in employment is expected to be greater than number of openings resulting from deaths and retirements.

[5]Total does not equal sum of individual estimates because all branches of engineering are not covered separately in *The Occupational Outlook Handbook*.

Index to the Job Outlook in Brief

Accountants 9
Actors 20
Actresses 20
Actuaries 9
Administrative and related occupations 9
Aerospace engineers 14
Agents, FBI 10
Agents, insurance 9
Agents, real estate 11
Agents, travel 12
Agricultural engineers 14
Air-conditioning mechanics 16
Airplane mechanics 13
Airplane pilots 13
Air traffic controllers 13
Air transportation occupations 13
All-round machinist 6
Anthropologists 19
Appliance repairers 16
Architects 20
Art, design, and communication-related occupations 20
Assemblers 7
Astronomers 15
Audiologists 18
Automobile body repairers 16
Automobile mechanics 16
Automobile painters 7
Automobile parts counter workers 11
Automobile sales workers 11
Automobile service advisors 11

Bank clerks 9
Banking occupations 9
Bank officers and managers 9
Bank tellers 9
Barbers 10
Bartenders 10
Bellhops 10
Bindery workers 7
Biochemists 15
Biomedical engineers 14
Blacksmiths 7
Blue-collar worker supervisors 7
Boat-engine mechanics 16
Boilermaking occupations 7
Boiler tenders 7
Bookbinders 7
Bookkeeping workers 8
Bowling-pin-machine mechanics 16
Brake operators 13
Bricklayers 12
Broadcast technicians 15
Brokers, insurance 9
Brokers, real estate 11
Building custodians 10
Bus drivers 13-14
Business machine repairers 16
Bus mechanics 17
Buyers 9

Carpenters 12
Cashiers 8
Cement masons 12
Central office craft occupations, telephone 16
Central office equipment installers, telephone 16
Ceramic engineers 14
Chefs 10
Chemical engineers 14
Chemists 15
Chiropractors 17
City managers 9
Civil engineers 14
Claim representatives 9
Cleaning and related occupations 10
Clergy 19
Clerical occupations 8
Collection workers 8
College career planning counselors 19
College placement counselors 19
College student personnel workers 9
College teachers 11
Communications-related occupations 20
Compositors 6
Computer and related occupations 8-9
Computer operating personnel 8
Computer service technicians 16
Conductors 13
Conservation occupations 14
Construction inspectors (government) 11
Construction laborers 12
Construction occupations 12-13
Cooks 10
Cooperative extension service workers 19
Coremakers 6
Correction officers 10
Cosmetologists 10
Counseling occupations 19
Credit managers 9

Dancers 20
Dental assistants 17
Dental hygienists 17
Dental laboratory technicians 17
Dentists 17
Design occupations 20
Dieticians 18
Dining room attendants 10
Dishwashers 10
Dispensing opticians 18
Display workers 20
Drafters 15
Driving occupations 13-14
Drywall installers and finishers 12

Economists 19
Education and related occupations 11
Electrical engineers 14
Electricians (construction) 12
Electricians, maintenance 16
Electric sign repairers 16
Electrocardiograph technologists and technicians 17
Electroencephalographic technologists and technicians 17
Electroplaters 7
Electrotypers 7
Elementary school teachers 11
Elevator constructors 12
Embalmers 10
Emergency medical technicians 17
Employment counselors 19
Engineering technicians 15
Engineers 14-15
Engineers, locomotive 13
Engineers, operating 12
Engineers, stationary 8
Environmental scientists 15

Farm equipment mechanics 16
FBI special agents 10
File clerks 8
Firefighters 10
Flight attendants 13
Floor covering installers 12
Floral designers 20
Food counter workers 10
Food technologists 16
Food service occupations 10
Foresters 14
Forestry technicians 14
Forge shop occupations 7
Foundry occupations 6
Funeral directors 10
Furniture upholsterers 16

Gas service station attendants 11
Geographers 19
Geologists 15
Geophysicists 15
Glaziers 12
Guards 10

Health and regulatory inspectors (government) 11
Health occupations 17-19
Health service administrators 18
Heating mechanics 16
Historians 19
Homemaker-home health aides 19
Hotel front office clerks 8
Hotel housekeepers 10
Hotel managers 9

Industrial designers 20
Industrial engineers 14
Industrial machinery repairers 16
Industrial production and related occupations 6-8
Inspectors (manufacturing) 7
Instrument makers (mechanical) 6
Insulation workers 12
Insurance agents 9
Insurance occupations 9
Intercity busdrivers 13
Interior designers 20
Ironworkers 12

Jewelers 16

Kindergarten teachers 11

Labor relations workers 9
Landscape architects 20
Lathers 12
Lawyers 9
Librarians 11
Library technicians 11
Licensed practical nurses 18
Life science occupations 15
Life scientists 15
Line installers and cable splicers, telephone 16
Lithographers 7
Local transit busdrivers 14
Local truckdrivers 14
Locomotive engineers 13
Locksmiths 16
Long distance truckdrivers 14

Machine tool operators 6
Machining occupations 6
Mail carriers 11
Maintenance electricians 16
Manufacturers sales workers 11
Marble setters 12
Marketing research workers 9
Mathematicians 15
Mathematics occupations 15
Meatcutters 10
Mechanical engineers 14
Mechanics and repairers 16-17
Medical laboratory workers 18
Medical practitioners 17
Medical record administrators 18
Medical record technicians and clerks 18
Medical technologist, technician, and assistant occupations 17-18
Merchant marine officers 13
Merchant marine sailors 13
Metallurgical engineers 14
Meteorologists 15
Millwrights 7
Mining engineers 15
Ministers, Protestant 19
Models 11
Molders 6
Motion picture projectionists 7
Motorcycle mechanics 16
Musicians 20

Newspaper reporters 20
Nursing aides and attendants 18
Nursing occupations 18

Occupational safety and health workers 11
Occupational therapists 18
Occupational therapy assistants 18
Oceanographers 15
Office machine operators 8
Office occupations 8-9
Orderlies 18
Organ tuners and repairers 17
Operating engineers 12
Operating room technicians 18
Opthalmic laboratory technicians 7
Opticians, dispensing 18
Optometric assistants 18
Optometrists 17
Osteopathic physicians 17

Painters 12
Parking attendants 14
Paperhangers 12
Patternmakers 6
Performing artists 20
Personal service occupations 10
Personnel workers 9
Pest controllers 10
Petroleum engineers 15
Pharmacists 19
Photoengravers 7
Photographers 20
Photographic laboratory occupations 7
Physical scientists 15
Physical therapist assistants and aides 18
Physical therapists 18
Physicians 17
Physicists 15
Piano tuners and repairers 17
Pipefitters 13
Plasterers 12
Plumbers 13
Podiatrists 17
Police officers 10
Political scientists 19
Postal clerks 8
Power truck operators 7
Priests, Roman Catholic 19
Printing occupations 6-7
Printing press operators 7
Private household workers 10
Production painters 7
Programmers 8
Protective and related service occupations 10-11
Protestant ministers 19
Psychologists 19
Public relations workers 20
Purchasing agents 9

Rabbis 19
Radio announcers 20
Radiologic (X-ray) technologists 18
Railroad occupations 13
Radio service technicians 17
Range managers 14
Real estate agents and brokers 11
Receiving clerks 8
Receptionists 8
Refrigeration mechanics 16
Registered nurses 18
Rehabilitation counselors 19
Repairers 16-17
Reporters, newspaper 20
Reservation agents, air transportation 13
Respiratory therapy workers 18
Retail trade sales workers 12
Roman Catholic priests 19
Roofers 13
Route drivers 12

Sales occupations 11-12
School counselors 19
Science technicians 15
Scientific and technical occupations 14-16
Secondary school teachers 11
Secretaries 8
Securities sales workers 12
Service occupations 10-11
Setup workers (machine tool) 6
Sheet-metal workers 13
Shipping clerks 8
Shoe repairers 17
Shop trades, railroad industry 13
Sign repairers, electric 16
Signal department workers, railroad industry 13
Singers 20
Social scientists 19
Social service aides 20
Social service occupations 19-20
Social workers 20
Sociologists 19
Soil conservationists 14
Soil scientists 15
Speech pathologists 18
State police officers 10
Station agents 13
Stationary engineers 8
Statistical clerks 8
Statisticians 15
Stenographers 8
Stereotypers 7
Stock clerks 8
Stonemasons 12
Surveying technicians 16
Surveyors 16
Systems analysts 9

Taxicab drivers 14
Teacher aides 11
Teaching occupations 11
Technical occupations 14-16
Technical writers 20
Telegraphers, railroad industry 13
Telephone craft occupations 16
Telephone and PBX installers and repairers 16
Telephone operators 11
Telephoners, railroad industry 13
Television announcers 20
Television service technicians 17
Terrazzo workers 12
Ticket agents, air transportation 13
Therapy and rehabilitation occupations 18
Tilesetters 13
Tool-and-die makers 6
Tower operators, railroad industry 13
Track workers 13
Transportation activities, occupations 13-14
Travel agents 12
Truck drivers 14
Truck mechanics 17
Typists 8

Underwriters 9
University teachers 11
Urban planners 9

Vending machine mechanics 17
Veterinarians 17

Waiters 10
Waitresses 10
Wastewater treatment plant operators 8
Watch repairers 17
Welders 8
Wholesale trade sales workers 12
Writers, technical 20

GRAB BAG

WHAT THIS COUNTRY NEEDS IS SOME MORE...

...secretaries, full-charge bookkeepers, accountants, auditors, computer programmers, engineers, nurses, machinists and metal lathe operators, and tool makers, according to a special edition of Occupations in Demand issued late in 1979 by the U.S. Department of Labor. It's available free from the Consumer Information Center, Pueblo, Colo. 81009. The publication tells where the jobs were and how much they paid for each of 97 occupations that were most frequently listed at the 2,500 Job Service offices around the country from July to September 1979. Besides the occupations already mentioned were electronics mechanic, keypunch operator, insurance sales agent, and guidance counselor.

The need for more skilled metalworkers was also reported by American Machinist. It quotes one personnel officer as saying, "There's no shortage.... They're just nonexistent." One reason for the shortage is that these occupations require many years of training and too many employers have been content to leave the training to the other guy, according to the report. So now, apprenticeship programs are completed by only 2,300 people a year while the Bureau of Labor Statistics projects a need for almost ten times that number of workers. Things might turn around, says the report, if more employers start training programs and if more bright high school students opt for the trades over college.

COLLEGE FEVER--THEY'VE CAUGHT IT

Total college enrollment in the Fall of 1979 increased 2.4 percent, according to estimates made by the National Center for Education Statistics (NCES). The enrollment of women increased even more than that of men, as it has been doing for some time. Women made up more than half (50.6 percent) of the total number of students.

The increase in enrollment exceeded what was expected. NCES offered three possible explanations for the rise: The number of 18-year olds went up; jobs were hard to find, so students weren't lured away from the campuses; and the amount of financial aid available increased.

Increases in enrollment are not expected to continue, however. Starting in the early 80's, NCES projects enrollments to begin to decline, in large part

because of the projected decline in the number of 18-year olds. According to the Bureau of the Census, there were about 4,300,000 18-year olds in 1979; there may be as few as 3,400,000 in 1990.

COLLEGE FEVER--EMPLOYERS LIKE IT

The employment market for college graduates is expected to continue to improve in 1980. But the demand will still be for graduates who studied technical subjects, such as engineering, accounting, and computer programming. That's the word from the College Placement Council Inc., in Bethlehem, Penn., which conducts surveys of major employers each year.

In its Fall survey, it learned that a strong market is projected for engineering graduates. At the bachelor's level, engineering hires are expected to increase 26 percent over 1979. The master's level reported a 22 percent rise and the doctoral level a 57 percent gain.

The science, math, and "other technical" category also reported healthy increases. All three degree levels showed improvement for an overall increase in hiring of 16 percent when compared with last year.

In the business-related disciplines, employers indicated that they expect to hire 8 percent more graduates than last year.

But for the "other nontechnical" category in the survey, an overall drop of 8 percent in hiring is anticipated by the private sector. This category of graduates includes more than one-third of the total.

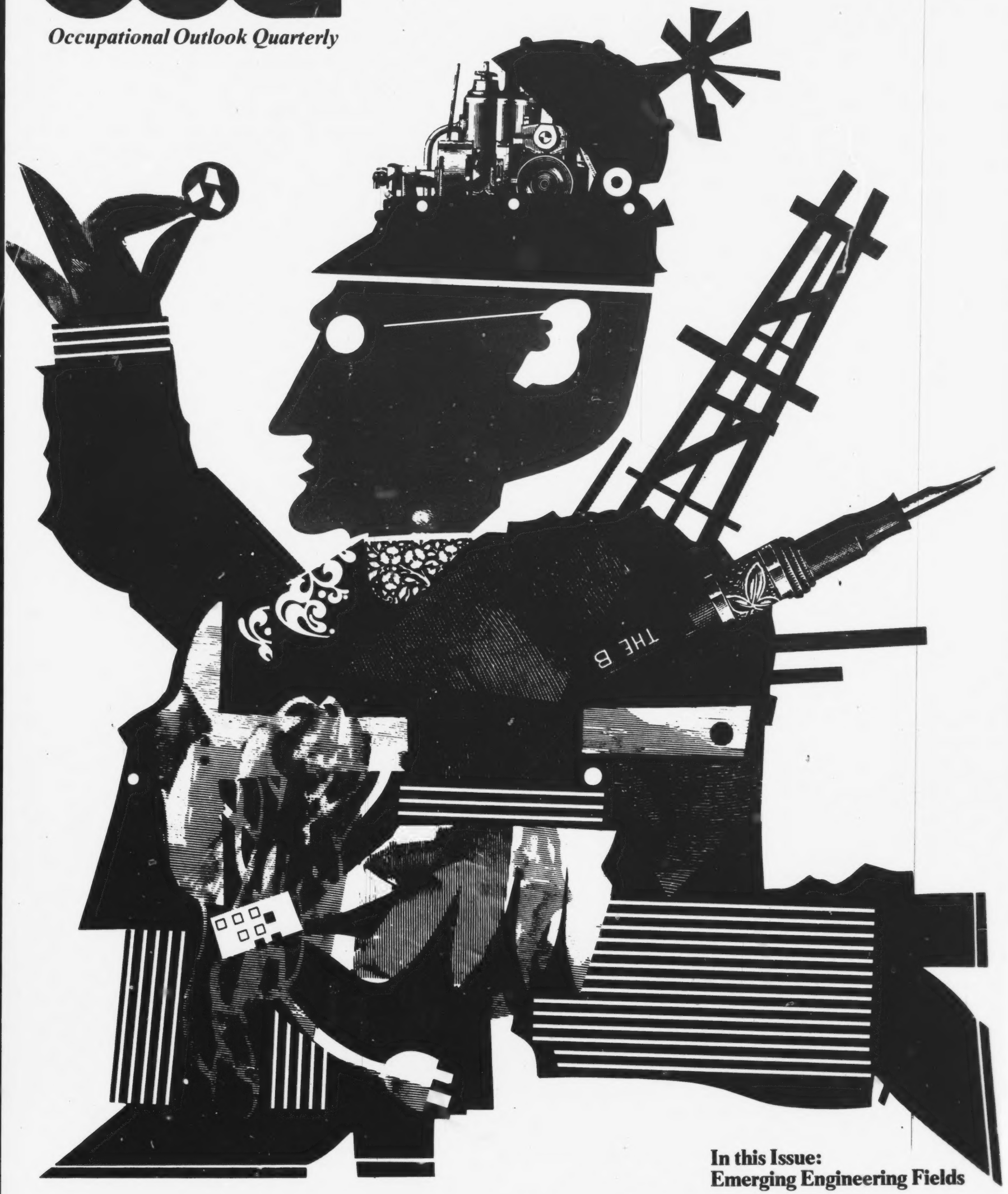
CO-ED VOC ED

The participation of women in vocational education programs that were once the domain of men is beginning to climb. According to Gene Bottoms, the executive director of the American Vocational Association, the number of women in agriculture programs went from 109,000 in 1976 to 173,000 in 1978; in technical education, during the same period, the number more than doubled, from 44,000 to 92,000; and in training programs for trade and industry occupations, their numbers increased from 338,000 to 524,000. He also says that women have made significant inroads in auto mechanics and electronics.

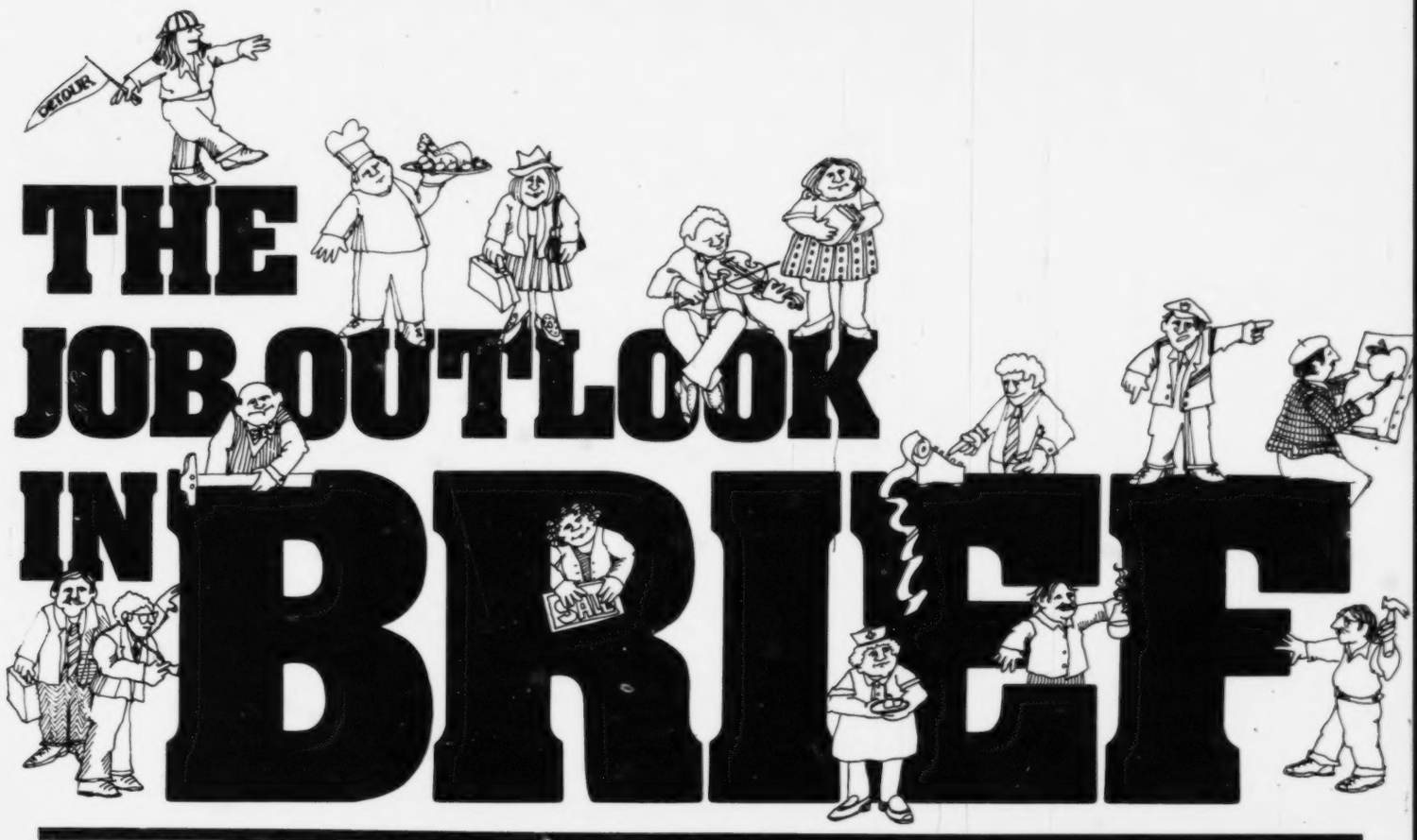
OOQ

Occupational Outlook Quarterly

U.S. Department of Labor
Bureau of Labor Statistics
Summer 1980



In this Issue:
Emerging Engineering Fields



THE JOB OUTLOOK IN BRIEF

by Thomas Nardone

The "Outlook in Brief" provides a quick rundown on more than 250 occupations, including information about

- the number of workers employed in 1978,
- the average number of job openings projected for each year between 1978 and 1990,
- and a summary of the prospects for employment throughout the 1980's.

Competition for jobs has stiffened in recent years, and the prospects for employment in an occupation have never been more important to people planning their careers. Although the job outlook is only one factor to consider about an occupation, it can become the crucial one if other things are equal. But before you check out specific occupations, look over the next couple of pages of general information. Having a general idea of how the outlook for an occupation is projected will help you decide how much weight to give this information when you balance one career against another.

The number of workers employed in any occupation depends on the demand for the goods and services provided by those workers. Employment of carpenters, for example, increased during the mid-1970's because millions of new homes were built. During the same period, employment of shoe repairers decreased because people threw away worn shoes rather than repairing them. Generally, if the demand for a product or a service grows, employment of the workers who provide that product or service will rise. However, there are exceptions to this rule.

Changes in the technology used to make products or provide services often enable business firms to increase output without hiring more workers. Mechanized book binding, for example has limited job opportunities in binderies, although there are more books being bound now then ever before. A change in business operations can have similar effects on employment. Despite the rising use of credit for shopping, the employment of credit managers has declined because retail stores have centralized their credit operations.

Changes in occupational employment also reflect variations in the growth rates of industries because occupations often are concentrated in certain industries. In 1978, for example, 80 percent of all white-collar workers and over 90 percent of all service workers were employed in service-producing industries: transportation and public utilities; wholesale and retail trade; finance, insurance, and real estate; services; and government. On the other hand, 60 percent of all blue-collar workers were employed in goods-producing industries: agriculture, mining, construction, and manufacturing. Since the 1950's, service-producing industries have grown faster than goods-

Thomas Nardone is a labor economist in the Division of Occupational Outlook, Bureau of Labor Statistics.

producing industries; consequently, employment in white-collar and service occupations has increased more rapidly than employment in blue-collar occupations.

Using information on the demand for goods and services, advances in technology, changes in business practices, and other factors, economists estimate the number of workers that will be employed in an occupation if past trends continue. To make these estimates, they also must make some assumptions about the future. Common assumptions are that there will be no war, that unemployment will not exceed a specific level, and that our system of government and basic social values will not change. A discussion of the assumptions and methods used by the Bureau of Labor Statistics is given in the *Occupational Outlook Handbook*.

It is important to realize the limitations of the information provided in "The Brief". Economists cannot read tarot cards and forsee with certainty events 10 years hence. The estimates of future employment are indicators of job prospects; but, they are subject to error. Furthermore, the employment summaries describe the situation for the entire nation. The outlook for any occupation may vary considerably among local job markets. For example, sections of the country that are growing very slowly usually have a much smaller need for elementary school teachers than do regions that have a rapidly rising population. Information on conditions in each State is available from the Job Service, which is listed in the State government section of local phone books.

Employment in the 1980's

Employment is expected to increase in almost all occupations through the 1980's if past trends continue and if the assumptions made about the future are accurate. Between 1978 and 1990, total employment will rise from 94.4 to 114.0 million workers, or 21 percent. One way to view this increase is that the expansion of the economy will create nearly 20 million new jobs. In addition to these new jobs, about 47 million additional openings are expected to result as people already working leave the labor force because of family duties, retirement, illness, or death. Of course, this general outlook includes a good deal of variation, as shown by examining the outlook for four broad groups of occupations—white-collar, blue-collar, service, and farm. (For each of these groups, the table on p. 5 shows employment in 1978 and the employment projected for 1990.)

White-collar occupations include professional, managerial, sales, and clerical jobs. They already account for over half the work force. The rising demand for people to work in environmental protection, energy development, and medicine will increase the need for many types of professional workers. Managers and clerical workers who are employed by all industries will benefit from the growth of the economy as a whole. And the expansion of retail trade will cause increased employment of sales workers. In addition to roughly 11 million jobs resulting from employment growth in all these occupations, more than 25 million openings will result from deaths and retirements.

Blue-collar occupations include craft, operative, and labor jobs, which account for about 33 percent of all employment. During the 1980's, their growth will be slower than the average for all occupations, but will still result in 5 million openings, and over 11 million job openings will occur from deaths and retirements. Blue-collar occupations are concentrated in mining, manufacturing, and construction. In these industries, the use of new production methods will allow more goods to be produced by fewer workers. Skilled blue-collar workers, such as tool-and-die makers and business machine mechanics, are less likely to be displaced by changes in technology than are unskilled workers and employment in those occupations will grow more rapidly than total blue-collar employment.

Service occupations include jobs in cleaning, food, health, personal, and protective services. They are expected to be the fastest growing group of occupations during the 1980's; but because this group is smaller than the white-collar and blue-collar groups, the total number of jobs becoming available will not be as large. In addition to almost 4 million openings due to employment growth, the service occupations will provide about 8 million openings from deaths and retirements. A larger population with more money to spend and the expansion of businesses will cause greater demand for many services. The employment of food service workers, for example, is expected to increase as people choose to dine out more often, and employment of protective service workers will increase because businesses want better security systems.

Farm occupations comprise the smallest of the occupational groups. Farm employment is expected to decline through the 1980's. The use of laborsaving equipment and more efficient farming methods will raise productivity enough to decrease the need for farmers and farm workers.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Retail trade sales workers	2,851,000	226,000	Employment expected to grow faster than average. High turnover should create excellent opportunities for full-time, part-time, and temporary work.
Route drivers	195,000	3,600	Employment expected to change little, but several thousand openings will result annually from replacement needs. Best opportunities for applicants who have sales experience and good driving records and who are seeking wholesale routes.
Securities sales workers	109,000	5,500	Employment expected to grow more slowly than average. Job opportunities fluctuate with economic conditions.
Travel agents	18,500	1,900	Employment expected to grow much faster than average. Because travel expenditures often depend on business conditions, job opportunities are very sensitive to economic changes.
Wholesale trade sales workers	840,000	40,000	Employment expected to grow about as fast as average as wholesalers sell wider variety of products and improve customer services. Good opportunities for persons with product knowledge and sales ability.
CONSTRUCTION OCCUPATIONS			
Bricklayers, stonemasons, and marble setters	205,000	6,200	Employment expected to grow more slowly than average. Job openings should be plentiful except during economic downturns.
Carpenters	1,253,000	58,000	Plentiful job opportunities except during economic downturns. Employment expected to grow due to increasing construction of new structures and alteration and maintenance of old ones. Carpenters with all-round training will have best prospects.
Cement masons and terrazzo workers	83,000	4,400	Employment expected to increase faster than average due to growing construction activity and greater use of concrete as a building material. Job opportunities should be favorable.
Construction laborers	860,000	49,000	Employment expected to grow about as fast as average due to increasing construction activity. Job openings should be plentiful except during economic downturns.
Drywall installers and finishers	82,000	(2)	Employment expected to grow faster than average as drywall is increasingly used in place of plaster.
Electricians (construction)	290,000	12,900	Employment expected to increase about as fast as average as more electricians are needed to install electrical fixtures and wiring in new and renovated buildings.
Elevator constructors	17,000	(2)	Employment expected to grow about as fast as average as number of high-rise apartments and commercial buildings increases.
Floor covering installers	88,000	3,200	Employment expected to increase faster than average due to expanding construction activity and widespread use of resilient floor coverings and carpeting. Best opportunities for persons able to install carpeting and resilient flooring.
Glaziers	19,000	1,000	Employment expected to increase faster than average as use of glass in construction increases.
Insulation workers	51,000	2,600	Employment expected to grow faster than average as energy saving insulation is installed in homes and businesses.
Ironworkers	78,000	4,100	Employment expected to increase faster than average for all occupations due to growing use of structural steel. Job opportunities are more abundant during early spring.
Lathers	23,000	(2)	Employment expected to change little due to increased use of drywall and other substitute materials.
Operating engineers	581,000	36,000	Employment expected to grow faster than average due to increasing construction activity. Job opportunities should be plentiful except during economic downturns.
Painters	484,000	26,000	Although some growth will result from new construction, employment expected to increase more slowly than average. The number of job openings fluctuates with amount of construction activity.
Paperhangers	20,000	1,500	Although the popularity of wall paper and vinyl wallcoverings is rising, employment of paperhangers is expected to grow more slowly than average.
Plasterers	28,000	1,100	Employment will grow more slowly than average as drywall materials are used in place of plaster. Some openings will result from replacement needs.

Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Plumbers and pipefitters	428,000	20,000	Employment expected to grow about as fast as average as a result of increased construction activity and the need to repair and modernize existing plumbing and piping.
Roofers	114,000	4,500	Employment expected to grow about as fast as average due to new construction and need to repair existing roofs. Demand for dampproofing and waterproofing also will stimulate need for more roofers. Because construction activity fluctuates, however, openings may be plentiful in some years, scarce in others.
Sheet-metal workers	70,000	3,500	Employment expected to increase faster than average due to use of air conditioning and heating ducts and other sheet-metal products in homes, stores, offices, and other buildings.
Tilesetters	33,000	1,800	Employment expected to increase faster than average due to a trend toward two or more tile bathrooms in houses and apartments.

OCCUPATIONS IN TRANSPORTATION ACTIVITIES

Air transportation occupations

Air traffic controllers	21,000	700	Although employment expected to grow about as fast as average, applicants are likely to face keen competition for available jobs. Best opportunities for college graduates with experience as controllers, pilots, or navigators.
Airplane mechanics	132,000	3,500	Employment expected to grow more slowly than average; but opportunities in various areas of aviation may differ. Good opportunities in general aviation; keen competition for airline jobs; opportunities in Federal Government dependent upon defense spending.
Airplane pilots	76,000	3,800	Employment expected to grow faster than average, but applicants are likely to face keen competition for available jobs. Best opportunities for recent college graduates with flying experience.
Flight attendants	48,000	4,800	Employment expected to grow much faster than average as airline travel increases. Competition for jobs likely to be keen.
Reservation, ticket, and passenger agents	56,000	2,200	Employment expected to grow about as fast as average as airline travel increases. Nevertheless, popularity of airline jobs will result in keen competition.

Merchant marine occupations

Merchant marine officers	13,500	700	Little change in employment expected as size of Nation's fleet remains fairly constant.
Merchant marine sailors	24,800	([4])	Employment expected to decline as smaller crews operate new ships. Keen competition likely for those openings created by replacement needs.

Railroad occupations

Brake operators	66,000	1,600	Little change in employment expected as laborsaving innovations in freight hauling moderate growth. Some openings will result from replacement needs.
Conductors	37,000	1,700	Employment expected to grow more slowly than average as technological advances increase freight hauling efficiency.
Locomotive engineers	34,000	2,000	Despite expected increase in demand for railroad services, slower than average employment growth likely as larger and better designed freight cars improve freight hauling efficiency.
Shop trades	76,000	2,100	Employment expected to decline as shop efficiency increases and railroad cars require less maintenance.
Signal department workers	12,800	450	Employment expected to grow more slowly than average as new signal systems require less maintenance.
Station agents	5,900	([4])	Employment expected to decline as centrally located stations handle more customer orders and billings and as mobile agents service smaller stations.
Telegraphers, telephoners, and tower operators	9,700	50	Employment expected to decline due to wider use of mechanized yard operations, centralized traffic control, and automatic signaling. Limited number of openings will arise due to replacement needs.
Track workers	59,000	1,400	Employment expected to change little due to use of laborsaving machines and installation of improved track control systems requiring less track.

Driving occupations

Intercity busdrivers	23,500	500	Employment expected to change little. Keen competition likely for job openings.
Local transit busdrivers	77,000	3,100	Employment expected to grow about as fast as average as many cities improve local bus service.

It's New!
It's for Junior High!

Exploring Careers

U.S. Department of Labor
Bureau of Labor Statistics
1979

Bulletin 2001

Years of experience enable this floor installer to work quickly.

arrive on the scene. The painters will paint the walls and ceilings, using brushes, rollers, or spray guns. They need to know the distribution of different paints, and how to mix different colors. Since Mr. and Mrs. Wright want wallpaper on the bathroom walls, *paperhangers* will be on the job as well. Both the painters and the paperhangers must be careful not to get in each other's way, and to do so that they can work rapidly that others have done. All of the [illegible] the final look of the house, and therefore attention to detail.

As the inside of the house near[ly] masons will return to lay the [illegible] *landscaper* will come in to [illegible] trees. And then one last step [illegible] construction laborers will clean [illegible] and the work site, and carry [illegible] finishing workers. Finally the [illegible] the Wrights.

Other Jobs in the Building [illegible]

A large project such as a [illegible] office building requires many [illegible] house. Furthermore, a [illegible] workers. On construction [illegible] are jobs for *elevator constructors* [illegible] elevators in high-rise buildings, [illegible] who install glass curtain walls. [illegible] *Ironworkers* erect the steel [illegible] parts in big buildings. [illegible] Plaster, rather than drywall, [illegible] ceilings in many commercial [illegible] tering is done, lathers install [illegible] or gypsum lath board to [illegible] concrete material. Plasterers [illegible] and ceilings with plaster [illegible] cement plaster or stucco [illegible] *setters* install marble [illegible] *Terrazzo workers* apply [illegible] such as stones, chips, [illegible] concrete with which [illegible]

What it Takes to Be [illegible]

As you have [illegible] Much of the work [illegible] almost every step [illegible] plated. Concrete [illegible] for example, [illegible] have been [illegible] wall frames are [illegible] caused by [illegible] worker hopes [illegible] enhance his

Construction Occupations

Workers inside all types of [illegible]

[illegible] to put up a building, construction [illegible] [illegible] work well with others. They must [illegible] [illegible] from those in charge, do their [illegible] [illegible] cooperate so that no one gets [illegible]

[illegible] other traits are important [illegible] [illegible] skilled. For plumbers, painters, [illegible] [illegible] bricklayers, and others, [illegible] [illegible] or skill, a talent for working [illegible] It takes manual dexterity [illegible] [illegible] with handtools [illegible] [illegible] and chisels that [illegible] [illegible] with precision. [illegible] [illegible] Do you [illegible] [illegible] a worker [illegible] [illegible] [illegible] [illegible]

Presenting *Exploring Careers*

by Anne Kahl

"Exploring careers means exploring yourself" is the theme of a new publication prepared by the staff of the *Occupational Outlook Handbook*. Aimed at junior high/middle school students, *Exploring Careers*, as the book is called, tries to broaden youngsters' horizons by increasing their understanding of the world of work—and of themselves—and by helping them identify and test new roles. It is not a simplified *Handbook*. Rather, it approaches its subject by linking occupational exploration to the personal growth that is such an important part of adolescence.

Exploring Careers is built around the idea that people are different and the paths they follow differ, too. Learning to assess a person's own abilities, and to match them with suitable jobs, is what career exploration is all about. *Exploring Careers* accordingly offers readers a way of relating their own interests to the demands of different careers. The book emphasizes the job as it is experienced by workers: the tasks, the tools, the relations with others, the training or experience needed, and the connection between the job and the way the worker lives. Both the positive and negative aspects of working are presented through photographs and day-in-the-life narratives that amount to personal encounters with real workers.

Exploring Careers begins with a chapter on "The World of Work and You." Photographs of youngsters in a variety of situations emphasize the link between career exploration and self-exploration. A special version of "Matching Personal and Job Characteristics" (based on a chart that appeared in the Fall 1978 *Occupational Outlook Quarterly)* gives students a chance to identify occupations that may be suitable for them, given their likes and dislikes. The chart provides a basis for discussing different jobs. It can also be used with interest inventories, aptitude tests, decisionmaking activities, and similar material. The first chapter also contains a table that teachers may find helpful. It identifies occupational clusters that can be introduced in each of the following academic subjects: Agriculture, art, business education, distributive education, driver education, health, home economics, industrial arts, language arts, mathematics, music, physical education, science, and social studies.

Each of the other 14 chapters in *Exploring Careers* describes the work done by people in a particular cluster of occupations. The clusters will be familiar to users of the *Handbook* because they are based on the same system of grouping similiar occupations. *Exploring Careers* groups occupations in the following clusters:

- industrial production occupations
- office occupations
- service occupations
- education occupations
- sales occupations
- construction occupations
- transportation occupations
- scientific and technical occupations
- mechanics and repairers
- health occupations
- social scientists
- social service occupations
- performing arts, design, and communications occupations
- agriculture, forestry, and fishery occupations.

Each of these chapters begins with an overview of jobs in the cluster. The overviews use dialogues and dramatic situations designed to bring the reader into the subject. After each overview are two or three narratives that follow individual workers through their daily tasks. A career game, a series of evaluative questions, and several suggested activities accompany each narrative. The career games introduce related occupations. The evaluative questions, which, like the rest of the book, are geared to junior high school students, give youngsters a chance to consider a particular job in terms of their own likes, dislikes, activities in school, and spare-time interests. The activity sections provide students with a way of learning about the world of work through direct involvement. Some of the suggested activities will appeal to youngsters as independent projects. Many others, however, are best suited to group or classroom use, as special assignments or projects. The emphasis is on "hands-on" activities rather than library research on occupations and careers. Tapping community resources is a basic axiom in implementing career education, and the activity sections suggest field trips, guest speakers, and other ways of strengthening links between the schools and the community, especially business, industry, and labor. Because *Exploring Careers* is written for youngsters who for the most part are too young to try out occupations by working, even summers or part time, the publication stresses volunteering as a means of career exploration. Several different types of volunteer work are suggested for most occupations.

Exploring Careers was designed for use in a variety of settings. It can serve as the basis for courses on vocations and careers; or it can be used to introduce career information into subject classes such as English or mathematics. It can also be used in guidance offices and career resource centers, either by groups or individuals. Librarians and counselors are likely to find that the publication's multi-volume format encourages browsing

Anne Kahl is a supervisory labor economist in the Division of Occupational Outlook, Bureau of Labor Statistics.

COUNSELING AIDS

Careers in Mental Health, prepared by the Public Health Service of the U.S. Department of Health, Education, and Welfare, indicates that careers in this most challenging area of health care and social service have expanded more in our country than those of any other profession. This 19-page booklet indicates that in some mental health jobs only brief on-the-job training is required, although others require many years of education. Occupations discussed include psychiatrist, psychiatric nurse, psychiatric aide, and various therapists. The booklet notes that along with caring sympathetically for people who need help, those who go into the field must face the cold hard facts of scientific diagnosis and treatment for the patient. Available from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. Stock no. 017-024-00463-4; price: $1.

Employment and Volunteer Opportunities for Older People, an 8-page fact sheet, tells an older American or someone working with him or her where to look for a job, either paid or unpaid. Local State Job Service offices, professional or trade associations, labor union employment services, church, YMCA, and YWCA vocational services, and Forty-Plus Clubs are some of the options recommended. Most of the publication is given over to descriptions of Federal and federally aided programs—including the Foster Grandparent Program, ACTION, Retired Senior Volunteer Program, VISTA, Peace Corps, and Senior Companion Program. Available free from the Consumer Information Center, Pueblo, Colo. 81009.

Unemployment Insurance: How It Works for You, describes what unemployment insurance is, what it does, who is helped, eligibility, benefits, disqualification, financing, and how to apply, in 12 pages. It makes the point that unemployment insurance provides spending power to workers while they search for another job and that 97 percent of all wage and salary jobs are now covered by unemployment insurance. Free, from the Employment and Training Administration, U.S. Department of Labor, Washington, D.C. 20213.

Out of the Service and Looking for a Job? Here's Help! is an 8-page booklet that points out to veterans that they are entitled to special consideration in finding a place in the job market or in acquiring further education. It spells out what these rights are and where a veteran can get help. Included is a benefit timetable, which tells veterans how soon they must apply for the benefit, and additional publications available upon request to veterans. Free, from the Employment and Training Administration, U.S. Department of Labor, Washington, D.C. 20213.

Training Opportunities in Job Corps, 24-pages, gives a list of vocational courses offered at 60 Job Corps centers in 31 States and Puerto Rico. It indicates that the Job Corps now operates three types of centers: Civilian Conservation Centers, Contract Centers, and Extension Centers. Organized by State, the booklet indicates each center's capacity, its operator, courses given, address, telephone number, and travel directions to the center. Free, from the Employment and Training Administration, U.S. Department of Labor, Washington, D.C. 20213.

United States Youth Conservation Corps, a 7-page flyer, describes the joint efforts of the Departments of Agriculture and Interior to provide a program to give gainful employment to America's youth, ages 15 through 18, during the summer months in a healthful, outdoor atmosphere. An understanding and appreciation of the Nation's natural environment and heritage on the part of youth who will ultimately be responsible for maintaining and managing natural resources for the American people can be the result. Teachers or college students are frequently hired as temporary supervisory help during the summer. Free, from the U.S. Department of Interior, Office of Youth Programs, Washington, D.C 20240 and the U.S. Department of Agriculture, Forest Service, Washington, D.C. 20250.

Helping Children Make Career Plans: Tips for Parents states that making a decision about a career is a process not an event. This 4-page flyer describes 15 ways in which a parent can help a child plan a career. For example, it suggests that a parent should "Help [the] child understand that it will be equally important to acquire a set of specific job skills and a set of adaptable skills for occupational success. For example, if [the] child is preparing for a career in journalism, it would be wise also to have a broad base of academic subjects that might be used in fields other than journalism." Available free from the Consumer Information Center, Pueblo, Colo. 81009.

Professional Energy Careers, a 45-page booklet, describes many careers tied to the energy program and indicates for each the high school courses that prepare students to enter a college program, the college curriculum, the availability of adult education programs, and the

names of organizations and societies that represent workers in the field. The occupations included are architect/architect engineer, chemist/chemical engineer, civil engineer/construction engineer, computer scientist/programmer, economist/accountant, electrical engineer, environmental engineer, geologist, geophysicist, lawyer, manager, marine engineer/naval architect, mathematician, mechanical engineer, metallurgist, mining engineer, nuclear engineer, petroleum engineer, physicist, and urban planner. Free from the U.S. Department of Energy, Technical Information Center, P.O. Box 62, Oak Ridge, Tenn. 37830.

Apprenticeship: Past and Present, looks at the history and current state of apprenticeship. It begins by tracing the origins of apprenticeship back to Europe, showing how it changed in the New World. Next, it discusses modern apprenticeship programs and looks at the new directions they are taking, especially in regard to the equal treatment of women and disadvantaged groups. Free from the Employment and Training Administration, Bureau of Apprenticeship and Training, U.S. Department of Labor, Washington, D.C. 20213.

Youth Serving the Community: Realistic Public Service Roles for Young Workers, R&D Monograph 68, presents information on public service projects particularly suitable or adaptable for young people. The publication has two parts. The first part discusses the selection of the particular project to be undertaken. The second focuses on four areas in which suitable projects might be started: housing, the environment, social services, and public safety. The discussion of each area includes information on such topics as the need and potential for such projects, barriers likely to be encountered, costs, organizations which should be involved, and planning. This 149-page book was published by the U.S. Employment and Training Administration. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock no. 029-000-00370-0; price: $4.75.

Science and Engineering Manpower Forecasting: It's Use in Policy Making, a 30-page report by the U.S. General Accounting Office, notes that labor-force statistics and forecasts are important in order for the Government to monitor the state of science and technology, "but policymakers must understand their limitations." Among the limitations, according to the report, are the nature of forecasts—which describe what will happen in a given set of circumstances but cannot predict the circumstances that will actually arise—and the impossibility of predicting how long it will take for institutions and individuals to respond to changing conditions. The report also examines the possibility of a shortage of job opportunities for young scientists during the 1980's. Single copies are available free from the U.S. General Accounting Office, Distribution Section, Rm. 1518, 441 G St. NW., Washington, D.C. 20548.

Chemists, A Career With FDA, is a 5-panel folder that explains the work of the Food and Drug Administration (FDA), the duties of a chemist with that agency, and the background one must have to enter the FDA as a professional. The folder points out that in some cases chemists may continue their education while working for the FDA and spells out the fringe benefits offered—including vacations, sick leave, pensions, holidays, and insurance. The folder, HEW Publication No. (FDA) 77-1023, is available free from the Food and Drug Administration, HFJ-10; Rockville, Md. 20857.

Today's Lawyer for the SEC describes the duties and location of jobs for lawyers with the Securities and Exchange Commission—the agency charged with administration and enforcement of several Federal statutes in the general fields of securities and finance. Jobs available are both those of law clerk (prior to admission to the bar) and attorney (for those already admitted to the bar). Write to or telephone any regional office of the Commission in Atlanta, Boston, Chicago, Denver, Fort Worth, Los Angeles, New York, San Francisco, Seattle, or Washington, D. C. Free from the Securities and Exchange Commission, Washington, D.C. 20549.

Handbook of Trade and Technical Careers and Training is a 46-page booklet published by the National Association of Trade and Technical Schools. It has two major sections. The first describes 94 occupations that are taught at trade schools and names the schools accredited by the Association that offer those subjects. The second is a list, by State, of the schools accredited by the Association. A pamphlet issued by the Association, **"How to Choose a Career. . . And a Career School,"** suggests some questions that a student should learn the answers to before enrolling in a school. Both publications are available free from the National Association of Trade and Technical Schools, 2021 K St. NW., Washington, D.C. 20006.

U.S. DEPARTMENT OF LABOR
RAY MARSHALL, SECRETARY

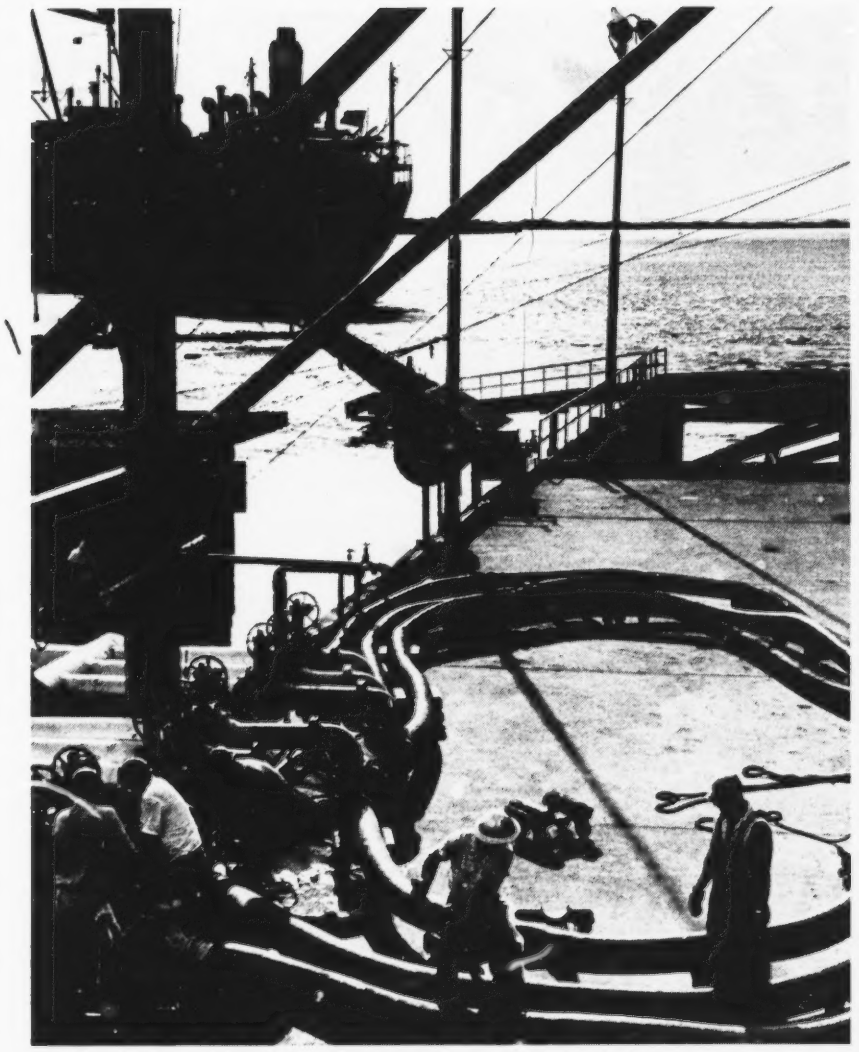
Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The *Occupational Outlook Quarterly* is published four times per year, $6 domestic, $7.50 foreign, $1.75 single issue, by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Riverdale, Md. (USPS 492-690). POSTMASTER: Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SUBSCRIPTIONS AND SALES ARE MANAGED BY THE U.S. GOVERNMENT PRINTING OFFICE. Correspondence regarding subscriptions should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Prices are subject to change by the U.S. Government Printing Office.

EDITOR'S NOTE: Articles contributed by authors outside of the U.S. Department of Labor do not necessarily represent the views of the Department. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 523-1386.

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 30, 1984.



BUREAU OF LABOR STATISTICS REGIONAL OFFICES

Boston
1603 JFK Federal Bldg.
Boston, Mass. 02203
Phone: (617) 223-6727

New York
Suite 3400
1515 Broadway
New York, N.Y. 10036
Phone: (212) 944-3121

Philadelphia
P.O. Box 13309
Philadelphia, Pa. 19101
Phone: (215)596-1154

Atlanta
1371 Peachtree St. NE.
Atlanta, Ga. 30309
Phone: (404) 881-4418

Chicago
9th Floor, Federal Office Bldg.
230 South Dearborn St.
Chicago, Ill. 60604
Phone: (312) 353-1880

Dallas
2nd Floor, 555 Griffin Square Bldg.
Dallas, Tex. 75202
Phone: (214) 767-6971

Kansas City
911 Walnut St.
Kansas City, Mo. 64106
Phone: (816)374-2481

San Francisco
450 Golden Gate Ave., Box 36017
SanFrancisco, Calif. 94102
Phone: (415) 556-4678

Occupational Outlook Quarterly

Melvin C. Fountain, *editor*

Neale Baxter, *managing editor*

Gail M. Martin, *staff writer*

Kris Jorgensen, *art director*

Summer 1980 Volume 24, Number 2

Emerging Engineering Fields: New Jobs in an Old Profession Gail M. Martin **2**
Cleaning up the world, harvesting the riches of the sea, and meeting America's need for more energy are among the goals of these specialized engineers.

The Great Womanhunt Ann Seltz-Petrash **14**
Schools and employers are both now searching for women who want to be engineers.

Fringe Around the Paycheck: Employee Benefits Gail M. Martin **17**
Benefits ranging from annual physicals to tuition payments are now an important part of a worker's "earnings."

Physician Assistants: When There's No Doctor in the House Donald Clark **20**
These specially trained professionals are doing many of the jobs previously done only by physicians.

Careers in Commodity Futures Trading Gail M. Martin **24**
The romance of gold and pork bellies—pork bellies?—surrounds this fast-growing industry, which employs brokers, account executives, and many other types of workers.

You're a What? Commodity Broker **30**
They found a future in futures.

Grab Bag **32**

Within each of the four occupational groups, the growth rates and the replacement needs of the various occupations will differ. Consequently, it is important to check the outlook for each occupation that interests you. The employment summaries beginning on p. 5 provide that information.

Information in the "Brief"

Most of the summaries of job prospects begin with a description of the growth expected. For consistency, each occupation's rate of growth is compared to the national average for all occupations, which is 21 percent. Half a dozen phrases are used to describe the rate of growth for each occupation; they are explained in the box, "Key Words in the 'Brief.'"

The rate of growth is, of course, only one indicator of future job prospects. As mentioned above, more jobs become available because working people leave the labor force than because of economic growth. On account of the need to replace workers, many large occupations that are growing only slowly actually offer more jobs than small, fast-growing ones. Employment of bookkeeping workers, for example, is expected to increase slowly over the next several years, but this occupation is so large and turnover is so high that 96,000 new workers will be needed each year. Podiatry, a much smaller occupation, is growing much faster than average, but only about 600 new podiatrists will be required each year.

The prospects for getting the job you want depend on more than just the number of openings. You must also consider the number of people looking for that kind of job. The words and phrases used to describe the amount of competition projected for an occupation are defined in the box, "Key Words in the 'Brief.'"

The analysis of the job outlook for the occupations does not take into account people who change occupations. When workers change occupations—not just jobs but the kind of job they do—they create openings in their old occupation and increase the supply of workers in the new one. When a drafter becomes an engineer, for example, an opening is available for a prospective drafter, but one less job is open for a future engineer. Information on such transfers is not available, so the projections of annual openings in the "Brief" do not take transfers into account. The estimates of the supply of applicants do not include transfers either. Work on developing this information is underway.

Organization of the "Brief"

Like the *Occupational Outlook Handbook* on which it is based, the "Brief" is arranged in 13 clusters of

Fastest Growing Jobs, 1978-90

Occupation	Annual openings
Bank Clerks	45,000
Bank officers and financial managers	28,000
Business machine repairers	4,200
City managers	350
Computer service technicians	5,400
Construction inspectors	2,200
Dental assistants	11,000
Dental hygienists	6,000
Dining room attendants and dishwashers	37,000
Flight attendants	4,800
Guards	70,000
Health service administrators	18,000
Homemaker-home health aides	36,000
Industrial machinery repairers	58,000
Landscape architects	1,100
Licensed practical nurses	60,000
Lithographers	2,300
Nursing aides, orderlies, and attendants	94,000
Occupational therapists	2,500
Occupational therapy assistants	1,100
Physical therapists	2,700
Podiatrists	600
Respiratory therapy workers	5,000
Speech pathologists and audiologists	3,900
Teacher aides	26,000
Travel agents	1,900

Note: For these occupations, employment in 1990 is projected to be at least 50 percent higher than it was in 1978.

Jobs With the Most Openings, 1978-90

Occupation	Annual openings
Secretaries and stenographers	305,000
Retail sales workers	226,000
Building custodians	180,000
Cashiers	119,000
Bookkeeping workers	96,000
Nursing aides, orderlies, and attendants	94,000
Cooks and chefs	86,000
Kindergarten and elementary teachers	86,000
Registered nurses	85,000
Assemblers	77,000
Waiters and waiteresses	70,000
Guards	70,000
Blue-collar worker supervisors	69,000
Local truck drivers	64,000
Accountants	61,000
Licensed practical nurses	60,000
Typists	59,000
Carpenters	58,000
Industrial machinery repairers	58,000
Real estate agents and brokers	50,000
Construction laborers	49,000
Engineers	46,500
Bank clerks	45,000
Private household workers	45,000
Receptionists	41,000
Wholesale trade sales workers	40,000

Note: Replacement needs and growth are projected to cause these occupations to offer the largest numbers of openings. Competition for openings will vary by occupation.

related jobs: Industrial production; office; service; education; sales; construction; transportation; scientific and technical; mechanics and repairers; health; social scientists; social service; and performing arts, design, and communications. (An index begins on p. 21.) This organization keeps occupations with similar characteristics together. Most clusters contain occupations that span a wide range of educational and training requirements. In the health occupations, for example, medical technologists generally need a degree from a 4-year college, while a 2-year program is normally sufficient for dental hygienists.

The "Brief" provides outlook information in a format that allows you to compare job prospects in different fields easily and helps you evaluate your job prospects. But employment prospects should never be the sole reason for choosing a career. Matching your goals and abilities to the work done on the job and the education required is an important part of the selection process. Where you want to live and how much money you want to earn also are important. The 1980–81 *Occupational Outlook Handbook* contains all this information for several hundred occupations and 35 industries. You can purchase a copy from a regional office of the Bureau of Labor Statistics—their addresses are listed on the inside front cover of this magazine—for $8.00 or use one of the copies usually available in libraries and the offices of school guidance counselors and employment counselors.

Choosing a career is a difficult task. The more information you have about the world of work, the easier it will be.

Key Words in the "Brief"

Changing Employment Between 1978 and 1990

If the statement reads...	Employment is projected to...
Much faster than average growth	Increase more than 50 percent
Faster than average growth	Increase 25 to 49.9 percent
Growth about as fast as average	Increase 15 to 24.9 percent
Growing more slowly than average	Increase 5 to 14.9 percent
Little change	Increase or decrease no more than 4.9 percent
Decline	Decrease 5 percent or more

Opportunities and Competition for Jobs

If the statement reads...	The demand for workers may be...
Excellent opportunities	Much greater than the supply
Very good opportunities	Greater than the supply
Good or favorable opportunities	About the same as the supply
May face competition	Less than the supply
Keen competition	Much less than the supply

Projected Change in Employment by Major Occupational Group, 1978-90

(In thousands)

Occupational Group	Employment			Openings		
	1978	Projected 1990	Percent Change[1]	Total	Growth	Replacements[2]
White-collar workers	47,205	58,400	23.6	36,800	11,200	25,600
Professional and technical workers	14,245	16,900	18.3	8,300	2,600	5,700
Managers and administrators, except farm	10,105	12,200	20.8	7,100	2,100	5,000
Sales workers	5,951	7,600	27.7	4,800	1,700	3,100
Clerical workers	16,904	21,700	28.4	16,600	4,800	11,800
Blue-collar workers	31,531	36,600	16.1	16,200	5,100	11,100
Craft workers	12,386	14,900	20.0	7,000	2,500	4,500
Operatives, except transport	10,875	12,500	15.0	5,600	1,600	4,000
Transport operatives	3,541	4,100	16.2	1,700	600	1,100
Nonfarm laborers	4,729	5,100	8.1	2,000	400	1,600
Service workers	12,839	16,700	29.9	12,200	3,800	8,400
Private household workers	1,162	900	—23.2	500	—300	800
Other service workers	11,677	15,800	35.2	11,700	4,100	7,600
Farm workers	2,798	2,400	—15.9	1,300	—400	1,700
Total	**94,373**	**114,000**	**20.8**	**66,400**	**19,600**	**46,800**

[1] Calculated from unrounded figures.
[2] Due to deaths, retirements, and other separations from the labor force. Does not include transfers out of occupations.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Local truckdrivers	1,720,000	64,000	Employment expected to increase faster than average due to growth in amount of freight. Best opportunities for applicants with a good driving record.
Long distance truckdrivers	584,000	21,500	Employment expected to grow about as fast as average. Keen competition is likely for jobs in this high-paying occupation.
Parking attendants	44,000	3,200	Employment expected to grow more slowly than average as trend to self-parking systems continues. High turnover rate, however, will create many job opportunities, especially in large commercial parking facilities in urban areas.
Taxicab drivers	94,000	4,300	Although employment expected to change little, high turnover should create many job opportunities.

SCIENTIFIC AND TECHNICAL OCCUPATIONS

Conservation occupations

Foresters	31,200	1,400	Employment expected to grow about as fast as average as environmental concern and need for forest products increase. But, applicants likely to face keen competition for jobs.
Forestry technicians	13,700	700	Employment expected to grow faster than average as technicians increasingly do tasks formerly handled by foresters. Even applicants with specialized postsecondary school training may face competition, however.
Range managers	3,700	200	Employment expected to grow faster than average. Good employment prospects likely as use of rangelands for grazing, recreation, and wildlife habitats increases.
Soil conservationists	9,300	450	Employment expected to increase as fast as average as organizations try to preserve farmland and comply with recent conservation and antipollution laws. Competition may be keen.

Engineers

Engineers	1,136,000[5]	46,500[5]	Employment expected to grow slightly faster than average. Good employment opportunities for graduates with an engineering degree.
Aerospace engineers	60,000	1,900	Employment expected to grow about as fast as average due to limited increase in Federal expenditures on space and defense programs.
Agricultural engineers	14,000	600	Employment expected to grow faster than average in response to increasing demand for agricultural products, modernization of farm operations, and increasing emphasis on conservation of resources.
Biomedical engineers	4,000	175	Employment expected to grow faster than average, but actual number of openings will be small. Increased research funds could create new jobs in instrumentation and systems for delivery of health services.
Ceramic engineers	14,000	550	Employment expected to grow faster than average as a result of need to develop and improve ceramic materials for nuclear energy, electronics, defense, and medical science.
Chemical engineers	53,000	1,800	Employment expected to grow about as fast as average. Growing complexity and automation of chemical processes will require additional chemical engineers to design, build, and maintain plants and equipment.
Civil engineers	155,000	7,800	Employment expected to increase about as fast as average as result of growing need for housing, industrial buildings, electric power generating plants, and transportation systems. Work related to environmental pollution and energy development will also cause growth.
Electrical engineers	300,000	10,500	Employment expected to increase about as fast as average due to growing demand for computers, communications equipment, military electronics, and electrical and electronic consumer goods. Increased research and development in power generation also should create openings.
Industrial engineers	185,000	8,000	Employment expected to grow faster than average due to industry growth, increasing complexity of industrial operations, expansion of automated processes, and greater emphasis on scientific management and safety engineering.
Mechanical engineers	195,000	7,500	Employment expected to increase about as fast as average due to growing demand for industrial machinery. Need to develop new energy systems and to solve environmental pollution problems will also cause growth.
Metallurgical engineers	16,500	750	Employment expected to grow faster than average due to need to develop new metals and alloys, adapt current ones to new needs, solve problems associated with efficient use of nuclear energy, and develop new ways of recycling solid waste materials.

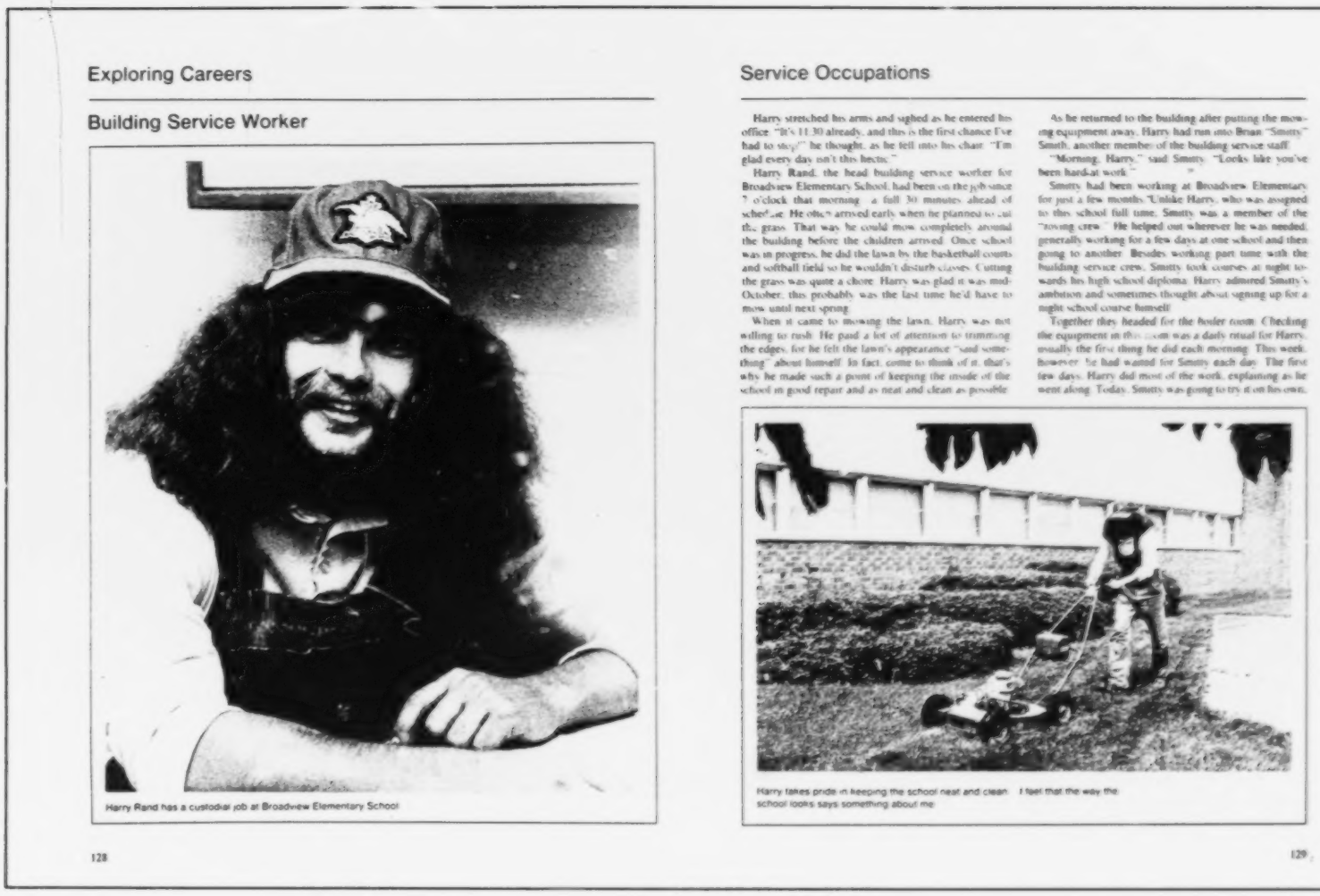
Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Mining engineers	6,000	600	Employment expected to grow much faster than average due to efforts to attain energy self-sufficiency and to develop better mining systems.
Petroleum engineers	17,000	900	Employment expected to grow faster than average as demand for petroleum and natural gas requires increased drilling and more sophisticated recovery methods.
Environmental scientists			
Geologists	31,000	1,700	Employment expected to grow faster than average as domestic mineral exploration increases. Good opportunities for persons with degrees in geology or earth science.
Geophysicists	11,000	600	Employment expected to grow faster than average as petroleum and mining companies need additional geophysicists who are able to use sophisticated electronic techniques in exploration activities. Very good opportunities for graduates in geophysics or related areas.
Meteorologists	7,300	300	Employment expected to increase about as fast as average. Favorable opportunities for persons with advanced degrees in meteorology. Others expected to face competition.
Oceanographers	3,600	150	Although employment expected to grow about as fast as average, competition for openings is likely. Best opportunities for persons who have a Ph.D.; those who have less education may be limited to research assistant and technician jobs.
Life science occupations			
Biochemists	20,000	900	Employment expected to grow faster than average due to increase in funds for biochemical research and development. Favorable opportunities for advanced degree holders.
Life scientists	215,000	11,200	Employment expected to grow faster than average due to increasing expenditures for medical research and environmental protection. Good opportunities for persons with advanced degrees.
Soil scientists	3,500	180	Little employment growth expected. Applicants may face competition for jobs.
Mathematics occupations			
Mathematicians	33,500	1,000	Slower than average employment growth is expected to lead to keen competition for jobs. Opportunities expected to be best for advanced degree holders in applied mathematics seeking jobs in government and private industry.
Statisticians	23,000	1,500	Employment expected to grow faster than average as use of statistics expands into new areas. Persons combining knowledge of statistics with a field of application, such as economics, may expect favorable job opportunities.
Physical scientists			
Astronomers	2,000	40	Little change in employment is expected as only slight increases in funds for basic research in astronomy are expected. Competition for jobs is likely to be keen.
Chemists	143,000	6,100	Employment expected to grow about as fast as average as a result of increasing demand for new products and rising concern about energy shortages, pollution control, and health care. Good opportunities should exist, except for academic positions.
Physicists	44,000	1,000	Although employment will grow more slowly than average, generally favorable job opportunities are expected for persons with advanced degrees in physics. However, persons seeking college and university positions, as well as graduates with only a bachelor's degree, will face keen competition.
Other scientific and technical occupations			
Broadcast technicians	40,000	(2)	Employment expected to increase about as fast as average as new radio and television stations are licensed and as cable television stations broadcast more of their own programs. Job competition is keen, however, and prospects are best in small cities.
Drafters	296,000	11,000	Employment expected to grow about as fast as average due to increasing complexity of designs of modern products and processes. Best prospects for graduates with associate degrees in drafting.
Engineering and science technicians	608,000	23,000	Employment expected to grow faster than average as more technicians will be needed to assist the growing number of engineers and scientists. Favorable job opportunities, particularly for graduates of postsecondary school training programs.

and leads to further occupational exploration. *Exploring Careers* is suitable for use in youth programs sponsored by community, business, and religious organizations. Career exploration is an important activity for youth-serving organizations such as the Girl Scouts of the U.S.A. and the Boy Scouts of America, to name just two of the many organizations concerned with helping youngsters prepare for responsible adult roles. Throughout the Nation, churches and synagogues, teen councils, Comprehensive Employment and Training Act (CETA) prime sponsors, and other groups are working with young people, encouraging them to learn job skills and behaviors and to familiarize themselves with the work environment. *Exploring Careers* provides occupational information that can aid such efforts.

To enhance its adaptability, *Exploring Careers* is available both as a single volume and as a set of 15 booklets that may be purchased separately. The single volume runs approximately 550 pages, and the individual booklets, which correspond to the 15 chapters, range in length from 30 to 50 pages each. Price and ordering information appears in the accompanying box.

Exploring Careers is an outcome of the Bureau's continuing program of occupational research. Developments in career education during the 1970's influenced the decision to proceed with another major vocational guidance publication. As career education took hold in the Nation's classrooms, the value of tailoring career materials to particular age groups became evident. Materials suitable for youngsters of

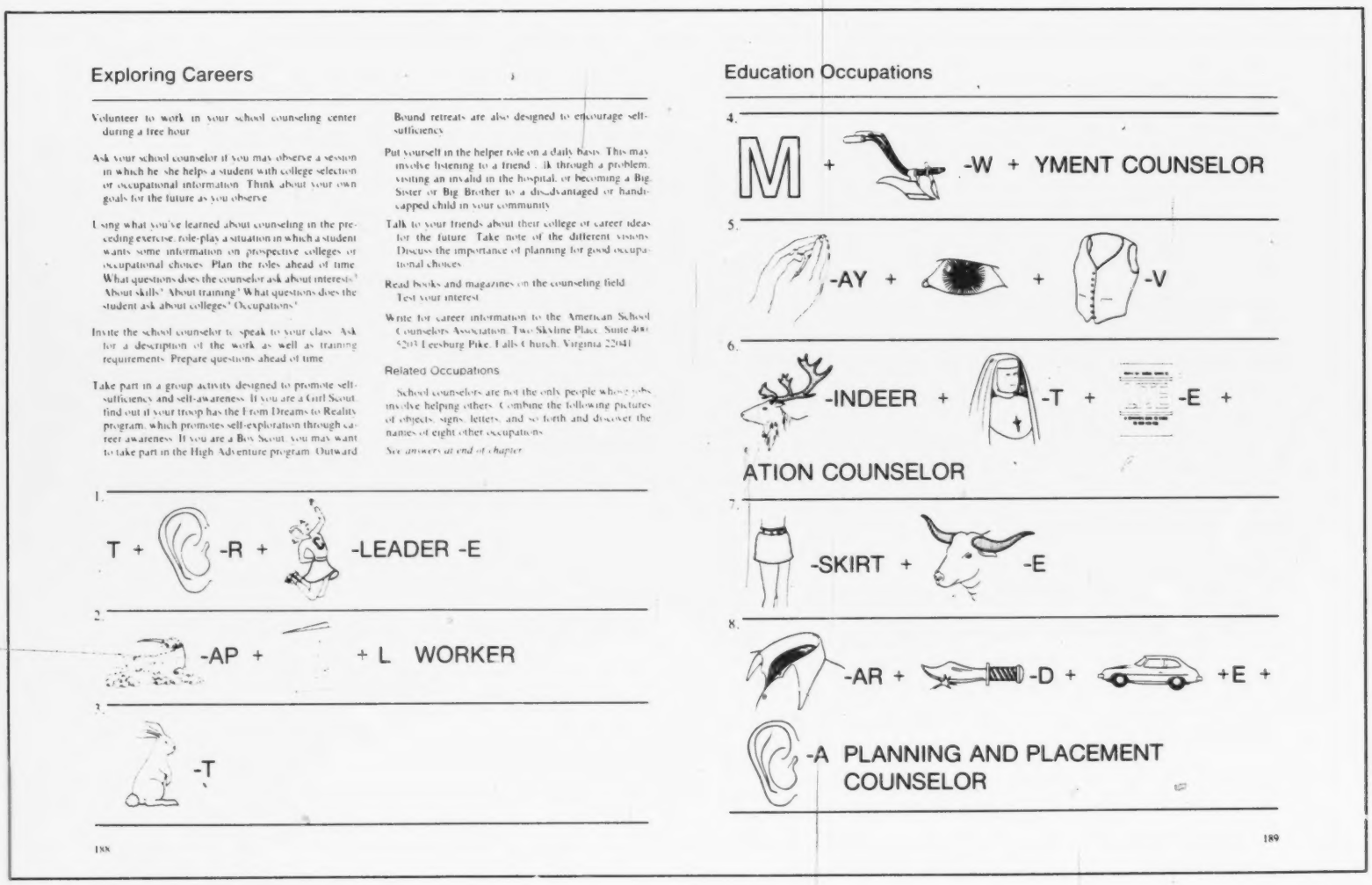

Exploring Careers
Building Service Worker
Harry Rand has a custodial job at Broadview Elementary School
128
Service Occupations
Harry stretched his arms and sighed as he entered his office. "It's 11:30 already, and this is the first chance I've had to stop!" he thought, as he fell into his chair. "I'm glad every day isn't this hectic."
Harry Rand, the head building service worker for Broadview Elementary School, had been on the job since 7 o'clock that morning, a full 30 minutes ahead of schedule. He often arrived early when he planned to cut the grass. That way he could mow completely around the building before the children arrived. Once school was in progress, he did the lawn by the basketball courts and softball field so he wouldn't disturb classes. Cutting the grass was quite a chore. Harry was glad it was mid-October; this probably was the last time he'd have to mow until next spring.
When it came to mowing the lawn, Harry was not willing to rush. He paid a lot of attention to trimming the edges, for he felt the lawn's appearance "said something" about himself. In fact, come to think of it, that's why he made such a point of keeping the inside of the school in good repair and as neat and clean as possible.
As he returned to the building after putting the mowing equipment away, Harry had run into Brian "Smitty" Smith, another member of the building service staff.
"Morning, Harry," said Smitty. "Looks like you've been hard at work."
Smitty had been working at Broadview Elementary for just a few months. Unlike Harry, who was assigned to this school full time, Smitty was a member of the "roving crew." He helped out wherever he was needed, generally working for a few days at one school and then going to another. Besides working part time with the building service crew, Smitty took courses at night towards his high school diploma. Harry admired Smitty's ambition and sometimes thought about signing up for a night school course himself.
Together they headed for the boiler room. Checking the equipment in this room was a daily ritual for Harry, usually the first thing he did each morning. This week, however, he had wanted for Smitty each day. The first few days, Harry did most of the work, explaining as he went along. Today, Smitty was going to try it on his own.
Harry takes pride in keeping the school neat and clean. I feel that the way the school looks says something about me.
129

Pictures and true-to-life stories show a typical day in the life of the worker.

junior high school age were especially needed, according to the counselors and teachers who advised the Bureau.

Serious efforts to launch the new publication began in 1975. The initial phase involved conferences with educators and visits to schools that had exemplary career education programs. Developing an outline and preparing a sample chapter were the next major steps taken. The Bureau sought the reactions of potential users by sending copies of the sample chapter out for review and conducting a field test for student reaction. As they were completed, draft chapters were subjected to a reading level analysis and a race/sex bias evaluation. Particular attention was given to the format and graphic design, and the hundreds of photographs used were selected to portray the wide range of jobs open to Americans, regardless of race, sex, or ethnic background.

Exploring Careers may be purchased from Regional Offices of the Bureau of Labor Statistics. Their addresses are listed on the inside front cover. Price of the single volume (BLS Bulletin 2001) is $10. Individual chapters (BLS Bulletins 2001-1 through 2001-15) cost $2. Their titles correspond to the title of the introduction, "The World of Work and You," and the names of the clusters of occupations mentioned in the accompanying article. A packaged set of all 15 chapters costs $12. Payments by check or money order made out to the Superintendent of Documents should accompany all orders.



Exploring Careers

Volunteer to work in your school counseling center during a free hour.

Ask your school counselor if you may observe a session in which he she helps a student with college selection or occupational information. Think about your own goals for the future as you observe.

Using what you've learned about counseling in the preceding exercise, role-play a situation in which a student wants some information on prospective colleges or occupational choices. Plan the roles ahead of time. What questions does the counselor ask about interests? About skills? About training? What questions does the student ask about colleges? Occupations?

Invite the school counselor to speak to your class. Ask for a description of the work as well as training requirements. Prepare questions ahead of time.

Take part in a group activity designed to promote self-sufficiency and self-awareness. If you are a Girl Scout, find out if your troop has the From Dreams to Reality program, which promotes self-exploration through career awareness. If you are a Boy Scout, you may want to take part in the High Adventure program. Outward Bound retreats are also designed to encourage self-sufficiency.

Put yourself in the helper role on a daily basis. This may involve listening to a friend talk through a problem, visiting an invalid in the hospital, or becoming a Big Sister or Big Brother to a disadvantaged or handicapped child in your community.

Talk to your friends about their college or career ideas for the future. Take note of the different visions. Discuss the importance of planning for good occupational choices.

Read books and magazines on the counseling field. Test your interest.

Write for career information to the American School Counselors Association, Two Skyline Place, Suite 400, 5203 Leesburg Pike, Falls Church, Virginia 22041.

Related Occupations

School counselors are not the only people whose jobs involve helping others. Combine the following pictures of objects, signs, letters, and so forth and discover the names of eight other occupations.

See answers at end of chapter.

1. T + -R + -LEADER -E

2. -AP + + L WORKER

3. -T

188

Education Occupations

4. M + -W + YMENT COUNSELOR

5. -AY + + -V

6. -INDEER + -T + -E + ATION COUNSELOR

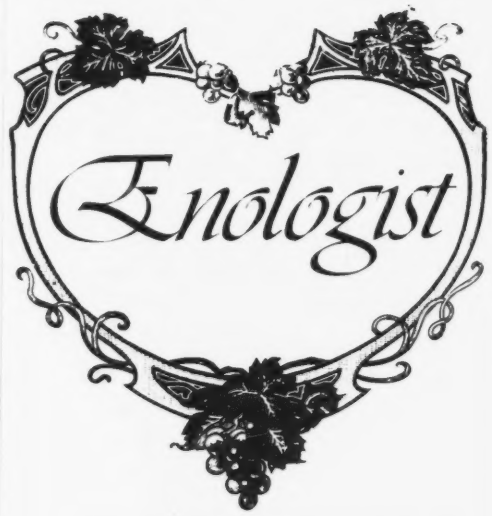
7. -SKIRT + -E

8. -AR + -D + +E + -A PLANNING AND PLACEMENT COUNSELOR

189

Suggested activities and puzzles help familiarize students with different careers.

You're a What?



Winemakers are members of one of the oldest professions. Eygptian records dating from 2500 B.C. refer to the use of grapes for winemaking. Also called enologists—from the Greek Word *oinos,* meaning *wine*—winemakers are limited in numbers. There are approximately 500 to 600 wineries nationwide in 35 States, each one having one winemaker. Whether Brother Timothy of the Christian Brothers or Jim Mitchell of Sakonnet Vineyards, this person is the official decision maker. To learn more about the profession and the talents a winemaker needs, we interviewed Jim Mitchell at the Mitchells' 36-acre vineyard and winery in Little Compton, Rhode Island.

OOQ: How did you get interested in winemaking?

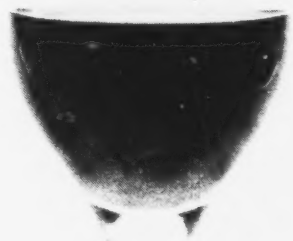
Mitchell: Well, I've had a few different careers. I've been an engineer in the chemical industry, served in the Foreign Service in Korea, and worked as an international consultant on energy and economic development. Although exciting, those careers required too many miles on airliners. My wife Lolly and I wanted to get some roots down somewhere. So we decided to settle here and put lots of roots down, about 23,000 to be exact! Seriously, Lolly and I assessed our complementary skills. She's always been in public relations and marketing work. I'm a research and development specialist, more interested in the technical side of things. We decided on a small venture which would involve land use and an art form. Winemaking fulfilled all of these requirements.

OOQ: What do you mean when you refer to winemaking as an art form?

Mitchell: I'm not sure winemaking is a profession—it may be more of an art. You can learn the technical skills at a school and winemaking is straight out of Chemistry I, but decisions in winemaking cross several professions: Viticulture (growing grapes), wine production, and marketing. And the decisions reflect the personality, preferences, and even the prejudices of the winemaker.

OOQ: Is your route of entry unusual?

Mitchell: Not particularly. Phil Wagoner of Boordy in Maryland was previously a newspaper editor for the Baltimore *Sun,* Mark Miller at Benmarl in the Hudson Valley was an illustrator, Evert Crosby of High Tor Vineyards was a playwright. I also know two other winemakers who changed careers. One was a pharmacist and the other a communications engineer before they became winemakers.



OOQ: What are the major duties of a winemaker?

Mitchell: The winemaker is responsible for vineyard management and cultivation including spraying, pruning, and training the vines, and planning the size of the crop, since these factors affect the quality of the wine. Winemakers also choose the varieties of grapes to plant, initiate grafting programs for new varieties, order soil tests, and run sugar/acid balance tests to decide when to harvest the grapes. The winemaker also decides when to crush and process each variety: how much and how long to press, how to choose yeasts for fermentation, and how to age and stabilize the juice as well as blend varieties.

Other decisions the winemaker must make are business oriented and involve the logo, label and

marketing of the wine. The chief winemaker also must keep up on the market and test and compare competitors' products with his or her own.

OOQ: How did you become proficient?

Mitchell: In the school of learning by doing, I suppose. A winemaker is like a chief engineer of senior executive in a large business. No one starts out being a winemaker—you work up to it since it is a job that involves judgment and experience. Since we were starting out with lots of business experience, but no experience in winemaking, we hired a consultant who had been a chief winemaker for a big winery before he retired. We also used a viticultural consultant—whom we retain even now—from New York State.

OOQ: What advice would you give young persons who want to become winemakers?

Mitchell: They should probably attend one of the recognized schools. Two of my employees now are graduates of college programs—one in viticulture and the other in enology. Of course, interested persons should learn all that they can about wine since it can be quite a difficult field to break into. But, it is a profession one can enter from several different directions. One good way is through a formal program, but it is obviously not the only way, as evidenced by the many successful winemakers who have never taken formal courses.

Of course, I also learned about wine through books, textbooks, conversations and travel. Wineries and vineyards hire extra help at busy times. A job as cellar rat—a worker who helps the cellar master brew, watch temperatures, clean tanks, and pump wine—can be valuable experience.

OOQ: Does a winemaker need any special abilities?

Mitchell: Like any other profession, winemaking requires dedication to excellence—not taking second best if you can possibly avoid it—combined with enough expertise in growing grapes and making wine to understand what makes for excellence. It also requires a good memory and an acute sense of taste, because you must remember subtle qualities of what you taste over long periods of time.

OOQ: Are there any disadvantages to the profession?

Mitchell: Winemaking, especially if you are the business owner, can mean long hours and hard work. But that is true of many professions. I've never worked harder or used more of everything I've ever learned.

The biggest disadvantage is that I've become a public person. Being a winemaker requires being subject to evaluation and criticism. The winemaker is totally responsible for the product, unlike many other executives or business people who share the responsibility. To be a good winemaker, you have to be a little bit of a workaholic. You also have to be a risk taker, and this includes all winemakers, even those who don't own the business.

OOQ: What do winemakers generally earn?

Mitchell: According to John Klug, employment analyst and researcher for the State of California Employment Development Department, beginning enologists in California with a B.S. degree generally earn from $900 to $1,200 a month. And enologists with experience in California earn from $1,600 to $2,600 a month, depending on the size of the winery, according to Klug.

OOQ: Where can interested readers write for more information on the profession?

Mitchell: For more information on careers in enology, readers may wish to write for a copy of the State of California Occupational Guide for enologists, Number 257. A free single copy may be obtained by writing to

Employment Development Dept.
Mail Control
800 Capitol Mall
Sacramento, CA 95814.

Gail M. Martin, an OOQ staffwriter, interviewed Mr. Mitchell.

EMERGING ENGINEERING FIELDS:

New Jobs in an Old Profession

by Gail M. Martin

For each decade, a new chapter on emerging careers in engineering could be written. Engineers have always been in the forefront of the technological changes that accompany industrial development. Traditionally, some of the greatest opportunities for young engineers have been presented by emerging fields. Using engineering principles in new spheres or old, engineers have provided the cutting edge for progress.

New fields in engineering have emerged in response to the needs of society. For example, environmental engineering developed because of our desire for clean air and water and a concern over the damage being done to the earth and ecological systems by pollution. Biomedical engineering grew out of society's desire to provide products and services of the highest quality for the sick and disabled. Ocean engineering developed as a result of our awareness of the great resources of the sea. Other engineering specialities that are becoming important include energy engineering, fire protection engineering, ceramic engineering, and plastics engineering.

Emerging fields in engineering have also been called nontraditional. Generally, information on these careers is less readily available than it is for more traditional fields. Engineers in nontraditional jobs are sometimes hard to identify since often times people doing the same job have different job titles. For example, an engineer working to eliminate air pollution may be known as an air pollution control engineer, an environmental engineer, or simply a mechanical engineer.

A characteristic common to most emerging engineering fields is the absence of a set route of entry. Also, many of these careers have no definitive method of preparation. For some, a solid background in one of the traditional engineering disciplines and a specialized graduate degree may be appropriate. For others, an undergraduate major in the emerging discipline may provide a head start. In most, a variety of preparatory avenues are possible.

Gail M. Martin is an OOQ staffwriter.

University of Florida, Gainesville

THE JOB OUTLOOK IN BRIEF

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
INDUSTRIAL PRODUCTION AND RELATED OCCUPATIONS			
Foundry occupations			
Pattern-makers	3,700	135	Employment expected to grow more slowly than average. Use of durable metal patterns will offset increases in foundry production.
Molders	21,000	500	Employment expected to increase more slowly than average. Although large demand likely for metal castings, labor-saving innovations will moderate employment growth.
Coremakers	12,000	350	Employment expected to increase more slowly than average as growing use of machine coremaking limits the need for additional workers.
Machining occupations			
All-round machinists	484,000	22,500	Employment expected to increase about as fast as average due to growing demand for machined metal parts. Many openings likely in maintenance shops of manufacturing plants.
Instrument makers (mechanical)	6,000	300	Employment expected to grow about as fast as average in response to the need for new and custom made instruments. Labor-saving innovations may limit growth somewhat.
Machine tool operators	542,000	19,600	Employment expected to increase about as fast as average as metalworking industries expand. Although advances in machine tools may affect some jobs, opportunities should be very good.
Setup workers (machine tools)	65,000	3,000	Employment expected to increase about as fast as average as demand for machined goods grows. Automatically controlled machine tools may limit need for additional workers.
Tool-and-die makers	170,000	8,600	Employment expected to increase about as fast as average as need for tools and dies continues. However, advances in tool making processes may limit growth.
Printing occupations			
Compositors	181,000	3,900	Employment expected to decline as trend to high-speed phototypesetting and typesetting computers continues. Best prospects for graduates of post-secondary school programs in printing technology.
Lithographers	28,000	2,300	Employment expected to increase much faster than average in response to continued growth of offset printing. Best job prospects for graduates of post-secondary school programs in printing technology.

Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Photo-engravers	8,000	150	Employment expected to decline as firms switch from letterpress to offset printing. Job opportunities will be scarce.
Electro-typers and stereo-typers	2,000	([2])	Employment expected to decline due to greater use of offset printing and other laborsaving equipment. Job opportunities will be scarce.
Printing press operators and assistants	167,000	5,000	Employment expected to increase more slowly than average as faster and more efficient presses limit growth. Applicants will face competition for jobs.
Bookbinders and bindery workers	69,000	2,600	Employment expected to increase more slowly than average due to increasing mechanization of bindery operations.
Other industrial production and related occupations			
Assemblers	1,164,000	77,000	Employment expected to increase faster than average due to growing demand for consumer products and industrial equipment. Since most jobs are in durable goods industries, however, economic changes and national defense spending often affect job opportunities.
Automobile painters	42,000	2,000	Employment expected to increase about as fast as average due to growing number of vehicles and traffic accidents. Job opportunities are best in heavily populated areas.
Blacksmiths	11,000	300	Employment expected to decline as blacksmiths are replaced by welders and machines in large shops. Slight increase in employment of farriers due to growing popularity of horseracing and recreational horseback riding.
Blue-collar worker supervisors	1,671,000	69,000	Employment expected to increase about as fast as average. Large part of increase in nonmanufacturing industries. Because competition for supervisory jobs is keen, the best opportunities are for workers with leadership ability and some college.
Boiler-making occupations	37,000	3,100	Employment expected to increase much faster than average due to construction of electric power-plants and expansion of manufacturing industries. Job opportunities are sensitive to economic conditions.
Boiler tenders	71,000	2,800	Little change in employment expected as more boilers are equipped with automatic controls.
Electro-platers	40,000	800	Little change in employment expected as increasing use of automated plating equipment restricts growth.
Forge shop occupations	77,000	2,000	Although forge shop production should expand considerably, little change in employment expected as improved forging techniques and equipment allow greater output per worker.
Inspectors (manufacturing)	771,000	35,000	Employment expected to increase about as fast as average as output of industry increases and manufactured goods become more complex. Some industries that employ inspectors are sensitive to economic conditions
Millwrights	95,000	4,700	Employment expected to increase about as fast as average due to construction of new plants, improvements in existing plants, and installation and maintenance of increasingly complex machinery.
Motion picture projectionists	11,000	750	Little change in employment expected. Growth in number of multi-screen theaters and use of laborsaving equipment will limit openings, thus creating keen competition for jobs.
Ophthalmic laboratory technicians	26,400	1,400	Employment expected to grow about as fast as average as more people use corrective lenses. Graduates of postsecondary school training programs will have the best job opportunities.
Photographic laboratory occupations	57,000	2,700	Employment expected to grow about as fast as average due to increasing use of photography in business, government, and research and rising popularity of amateur photography.
Power truck operators	363,000	14,000	Employment expected to increase about as fast as average as more firms use power trucks in place of hand labor. Job opportunities depend upon demand for manufactured goods.
Production painters	133,000	5,200	Employment expected to grow about as fast as average. Although manufacturing output is rising rapidly, increased use of automatic painting processes and other laborsaving innovations will moderate demand for painters.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Food technologists	15,000	500	Employment expected to grow about as fast as average due to increasing demand for food technologists in research and development, quality control, and production. Favorable opportunities for persons with food technology degrees.
Surveyors and surveying technicians	62,000	2,300	Employment expected to grow about as fast as average due to increased construction activity. Job opportunities are affected by economic conditions.
MECHANICS AND REPAIRERS			
Telephone craft occupations			
Central office craft occupations	135,000	1,000	Little change is expected in employment as more efficient electronic switching systems replace electromechanical ones.
Central office equipment installers	21,400	(4)	Employment expected to decline as most new central office equipment is manufactured in components that come partially assembled.
Line installers and cable splicers	59,000	600	Little change in employment as technological improvements limit growth. Job openings may be found more easily in small cities.
Telephone and PBX installers and repairers	115,000	3,000	Employment expected to increase about as fast as average due to growing number of telephones and PBX and CENTREX systems.
Other mechanics and repairers			
Air-conditioning, refrigeration, and heating mechanics	210,000	8,200	Employment expected to increase about as fast as average. Beginning mechanics may face competition for the highest paying jobs.
Appliance repairers	145,000	6,900	Employment expected to grow about as fast as average due to increasing use of appliances as population and incomes rise.
Automobile body repairers	185,000	7,800	Employment expected to increase faster than average due to increasing numbers of vehicles and traffic accidents.
Automobile mechanics	860,000	37,000	Employment expected to increase about as fast as average due to growing number of automobiles. Job opportunities will be plentiful.
Boat-engine mechanics	20,000	1,000	Employment expected to grow about as fast as average due to increasing number of boats. Job opportunities particularly favorable for mechanics with knowledge of electricity and electronics.
Bowling-pin-machine mechanics	6,200	(2)	Employment expected to increase more slowly than average due to limited growth in number of bowling facilities.
Business machine repairers	63,000	4,200	Employment expected to grow much faster than average as number of machines increases. Employment prospects will be good.
Computer service technicians	63,000	5,400	Employment expected to grow much faster than average as more computer equipment is used. Good opportunities for persons with postsecondary school training in electronics.
Electric sign repairers	15,000	700	Employment expected to increase as fast as average due to need to maintain growing number of electric signs.
Farm equipment mechanics	62,000	3,500	Employment expected to increase about as fast as average as more complex farm equipment requires greater maintenance. Best opportunities for persons familiar with farms and farm machinery.
Furniture upholsterers	29,000	1,100	Little change in employment expected as people buy new furniture instead of reupholstering the old.
Industrial machinery repairers	655,000	58,000	Employment expected to increase much faster than average as more repairers will be needed to maintain machinery used in increasingly complex manufacturing, coal mining, oil exploration, and other industries.
Jewelers	32,000	(2)	Employment expected to grow about as fast as average as the demand for jewelry increases. Because of a shortage of skilled jewelers, opportunities for people with training in jewelry design, construction, or repair should exist throughout the industry.
Locksmiths	15,000	(2)	Employment expected to grow about as fast as average as public becomes more security conscious. Favorable opportunities for persons able to install and service electronic security systems.
Maintenance electricians	300,000	15,500	Employment expected to increase faster than average in response to increased use of electrical and electronic equipment in industry.
Motorcycle mechanics	13,000	500	Employment expected to grow about as fast as average due to rising number of motorcycles. Best opportunities for persons with experience and their own tools.

Notes are on page 21.

Occupation	Estimated employment, 1978	Average annual openings 1978-90[1]	Employment prospects
Piano and organ tuners and repairers	8,000	700	Employment is expected to grow more slowly than average as use of pianos and organs is limited by competition from other forms of entertainment and recreation. Opportunities for beginners will be best in piano and organ dealerships and large repair shops.
Shoe repairers	22,000	1,600	Despite little change in employment, job prospects should be very good because of replacement needs. Because training is difficult to obtain, many openings are not filled.
Television and radio service technicians	131,000	6,100	Employment expected to grow faster than average as number of home electronic products such as television sets, radios, phonographs, and tape recorders increases.
Truck mechanics and bus mechanics	165,000	6,800	Employment of truck mechanics expected to grow faster than average due to increasing use of trucks for transporting freight. Employment of bus mechanics expected to increase about as fast as average.
Vending machine mechanics	23,000	(2)	Employment expected to increase about as fast as the average as more vending machines are put in service.
Watch repairers	19,000	(2)	Although employment expected to grow more slowly than average, trained workers should find jobs readily available. Opportunities should be good for persons trained in repairing electronic watches.

HEALTH OCCUPATIONS

Dental occupations

Dentists	120,000	5,500	Employment expected to grow faster than average due to population growth, increased awareness of importance of dental care, and expansion of prepayment arrangements. Opportunities for jobs should be very good.
Dental assistants	150,000	11,000	Employment expected to grow much faster than average as dentists increasingly use assistants in their practice. Excellent opportunities for full- and part-time jobs, expecially for graduates of approved programs.
Dental hygienists	35,000	6,000	Employment expected to grow much faster than average because of expanding population and growing awareness of importance of regular dental care. Opportunities for jobs should be good.
Dental laboratory technicians	47,000	2,800	Employment expected to grow faster than average due to expansion of dental prepayment plans and increasing number of older persons who require dentures. Excellent opportunities for graduates of approved programs.

Medical practitioners

Chiropractors	18,000	1,500	New chiropractors may have difficulty establishing a practice due to dramatic increases in number of chiropractic graduates. Best opportunities in small towns and areas with few practitioners.
Optometrists	21,000	1,600	Employment expected to grow faster than average due to increase in population and greater recognition of importance of good vision. Employment prospects will be favorable.
Physicians and osteopathic physicians	405,000	19,000	Employment outlook expected to be favorable. New physicians should have little difficulty in establishing new practices.
Podiatrists	8,000	600	Employment expected to grow faster than average as expanding population demands more health services. Opportunities for graduates to establish new practices or to enter salaried positions should be favorable.
Veterinarians	33,500	1,700	Employment expected to grow faster than average because of growth in number of pets. New veterinarians may face competition in some areas.

Medical technologist, technician, and assistant occupations

Electrocardiograph technicians	20,000	(2)	Employment expected to grow faster than average as greater reliance placed on electrocardiographs to diagnose heart diseases and to examine older patients. Best opportunities for those with postsecondary school training.
Electroencephalographic technologists and technicians	7,000	500	Employment expected to grow faster than average due to increased use of EEG's in surgery and in diagnosing and monitoring patients with brain disease.
Emergency medical technicians	115,000	(2)	Employment expected to grow faster than average due to increasing public awareness of need for emergency medical service. Keen competition for jobs likely.

Guide for Occupational Exploration

by Michael J. Walker

The U.S. Employment Service (USES)—the people who publish the *Dictionary of Occupational Titles* (DOT)—have brought out another major contribution to career guidence, the *Guide for Occupational Exploration.* Secondary school counselors and Job Service counselors are saying it is one of the best publications on career counseling to come down the pike in decades. USES Director David O. Williams tells why:

"Both jobseekers and counselors have for a long time needed a publication like the *Guide* for several reasons. First, the burden of career exploration has rested mostly on the counselor, owing to a lack of materials through which the jobseeker could be directly involved. Second, there has been no comprehensive publication that enables jobseekers to relate aptitudes, interests, and skills to the requirements of many specific and available jobs and groups of jobs. Third, there has been a language problem: Counseling materials are often couched in highly specialized jargon that most jobseekers cannot understand."

Now, however, "new tools have been developed by USES that will help the counselor and jobseeker overcome these obstacles," Williams says. "The *Guide* is one of the tools and will benefit the Job Service, secondary school counseling centers, and rehabilitation agencies."

According to Williams, USES, having been the repository for decades of much information about the requirements of jobs and the corresponding interests, aptitudes, and skills of persons seeking and working in such jobs, was in a good position to develop the *Guide.* The accumulated information needed to be organized and presented effectively. From the DOT, the agency's occupational analysts and research psychologists took a broad spectrum of jobs, recorded the activities common to their performance, and then put together an interest inventory test. This test, consisting of 307 different job activities, was administered to 1,000 persons to determine what the interests were of people who performed such activities. From an analysis of responses to this test, occupational experts were able to cluster job activities under 12 broad interest areas representative of the world of work.

"I am excited about the publication of the **Guide for Occupational Exploration** *because of its potential value within career development and vocational counseling for a wide range of individuals. I am particularly pleased about the* **Guide** *in terms of its emphasis upon interests, down-to-earth language, and relatedness to other occupational resources."*

Charles M. Page, Chief, Vocational Adjustment Department, Medical Center Rehabilitation Hospital, University of North Dakota

The book is organized for easy access to specific subject areas. It describes how persons without counselor assistance can use the book for career exploration and how counselors can use it; it gives definitions of concepts used in developing the interest areas; and it summarizes the 12 broad interest areas in the world of work. The body of the book is devoted to describing job requirements in each of the areas, including the aptitudes, skills, and training needed to gain access to and perform a specific job.

There are twelve general interest areas that form the basis for the *Guide:*

- Artistic: Expressing feelings or ideas creatively.
- Scientific: Discovering, collecting, and analyzing information about the natural sciences.
- Plants and Animals: Working with plants and animals, usually in an outdoor setting.
- Protective: Using authority to protect people and property.
- Mechanical: Understanding mechanical principles and applying them to practical situations using machines, hand tools, or instruments.
- Industrial: Performing repetitive, concrete, organized activities in a factory setting.
- Business Detail: Organizing clearly defined activities requiring accuracy and attention to detail, primarily in an office setting.
- Selling: Bringing others to a point of view through persua-

Michael J. Walker is a writer-editor with the Employment and Training Administration, U.S. Department of Labor.

sion, using sales and promotion techniques.

- Accommodating: Catering and serving others, usually on a one-to-one basis.
- Humanitarian: Helping individuals with their mental, spiritual, social, physical, or vocational concerns.
- Leading-Influencing: Aiding others through activities involving a high level of verbal or numerical abilities.
- Physical Performing: Fulfilling physical feats, as in sports.

These 12 areas are broken down into 66 work groups. For example, Artistic is numerically coded 01 and contains these work groups:

01.01 Literary Arts
01.02 Visual Arts
01.03 Performing Arts: Drama
01.04 Performing Arts: Music
01.05 Performing Arts: Dance
01.06 Craft Arts
01.07 Elemental Arts
01.08 Modeling.

The groups are divided further into 348 subgroups under which 12,000 specific jobs are listed and numerically coded and cross referenced to the DOT, where definitions of each job are given. For example, Literary Arts has three subgroups: 01.01-01, Editing; 01.01-02, Creative Writing; and 01.01-03, Critiquing.

Other work groups are handled the same way. For example, Mechanical, coded 05, contains these groups:

05.01 Engineering
05.02 Managerial Work: Mechanical
05.03 Engineering Technology
05.04 Air and Water Vehicle Operation
05.05 Craft Technology
05.06 Systems Operation
05.07 Quality Control
05.08 Land and Water Vehicle Operation
05.09 Materials Control
05.10 Crafts
05.11 Equipment Operation
05.12 Elemental Work: Mechanical

And—just as in 01.01 Literary Arts—05.01 Engineering has subgroups: 05.01-01, Research; 05.01-02, Environmental Protection; 05.01-03, Systems Design; 05.01-04, Testing and Quality Control; 05.01-05, Sales Engineering; 05.01-06, Work Planning and Utilization; 05.01-07, Design; and 05.01-08, General Engineering.

Each group begins with a broad statement about the typical duties of jobs that fall under that group. For example, under "Literary Arts," is the statement: "Workers in this group write, edit, or direct the publication of prose or poetry. They find employment on newspapers or magazines, in radio and television studios, and in the theater and motion picture industries. Some writers are self-employed and sell stories, plays, and other forms of literary composition to publishers."

Note that groups requiring the most education and training are listed first.

In each of the work groups, jobseekers are asked a series of career questions, such as: "What kind of work would you do?" "What skills and abilities do you need for this kind of work?" "How do you know if you would like or could learn to do this kind of work?" "What else should you consider about these jobs?" "How can you prepare for and enter this kind of work?" The answers to these questions provide the jobseeker with pertinent information related to each job. Finally, the entry includes a list of job titles from the DOT, where more information about the various occupations can be found.

The *Guide* is one part of a larger system being refined by USES psychologists and occupational analysts to help improve current testing and counseling tools and practices. The refined system calls for the use of both new and updated tests and relies heavily on the counselor to assist the jobseeker explore careeer possibilities. Thus, the counselor remains the most essential part of the career exploration process, even though the *Guide* enables self-exploration by jobseekers.

Williams says, "USES is devel-

"The new* Guide *has the potential of being one of the most frequently used resources in our counseling program. Unlike earlier materials, the* Guide *presents vocational information that is condensed yet thorough, understandable, easy to use, and practical. Employment counselors have long been waiting for a resource tool of this nature."

Jack L. Snyder, State Counseling Supervisor, California Employment Development Department

Employers must comply with

CHILD LABOR LAWS

by Betty Hayes

With the end of this school year approaching, many of the nation's youth are either looking for or ready to begin summer jobs. The U.S. Department of Labor reminds employers and young people that there are child labor laws which must be observed.

Federal child labor laws, enforced by the department's Wage and Hour Division, set standards protecting minors from employment that might interfere with their educational opportunities, or endanger their health or well-being.

Assistant Secretary of Labor for Employment Standards, Donald Elisburg, urges employers to familiarize themselves with federal and state child labor laws that apply to the type of business in which they are engaged. When both federal and state laws apply, the more stringent law must be observed.

Under the federal law, the child labor provisions do not apply to anyone aged 18 and over.

At 16 and 17 years of age, youths may be employed without a limit on hours worked and in any occupation other than a nonagricultural one that has been declared hazardous by the Secretary of Labor. Hazardous occupations include

- Working with explosives and radioactive materials;
- operating certain power-driven woodworking, metalworking, bakery and paper products machinery;
- operating various types of power-driven saws and guillotine shears;
- operating most power-driven hoisting apparatus such as nonautomatic freight elevators, for lifts, and cranes;
- operating certain power-driven meat processing machines; or most jobs in slaughtering and meat packing establishments;
- most jobs in mining, roofing, demolition, and excavation;
- operating motor vehicles or working as outside helper on motor vehicles;
- most jobs in logging and sawmill operations; and
- most jobs in the manufacturing of bricks, tiles and similar products.

Workers 14 and 15 years of age can be employed in a variety of jobs such as clerical and office work; various retail and food service jobs; errand and delivery work by foot, bicycle, or public transportation. And they may work at gas stations dispensing gas and oil and performing courtesy service.

Fourteen and 15 year olds are excluded from working in all hazardous occupations, manufacturing or mining; most processing occupations; operating or tending most power driven machinery; and as public messengers. In work connected with warehousing, storage, transportation, communications, public utilities, and construction, they may hold office jobs.

In any job, those aged 14 or 15 may work between 7 a.m. and 9 p.m. from June 1 through Labor Day, and when school is not in session they may work no more than 8 hours a day, 40 hours a week.

When school is in session, work time is limited to three hours on a school day outside of school hours and totaling no more than 18 hours a week.

The child labor provisions do not apply to newspaper delivery to consumers; performing in theatrical, motion picture or broadcast productions; or to children working for their parents except in manufacturing or nonagricultural hazardous occupations.

Laws pertaining to farm employment are somewhat different. Youths 16 or older have no restriction; 14 and 15 years olds may work outside of school hours in any farm job other than those declared hazardous by the Secretary of Labor; and 12 and 13 year olds may work in nonhazardous jobs outside school hours with written parental consent or on a farm that also employs the parents. Minors under 12 may work in nonhazardous agricultural jobs outside school hours with written parental consent on farms that have no employees that have to be paid the minimum wage.

Certain hazardous farm work may be done by youths 14 and 15 years old who have received certificates for satisfactory completion of special 4-H or vocational agricultural training courses. The restrictions do not apply to children of any age working on a farm owned or operated by their parents.

Most state child labor laws require employers to obtain employment or age certificates (work permits) for minor employees. The federal Fair Labor Standards Act contains no such requirement. However, employers who make it a practice to obtain permits can protect themselves from unintentionally violating the law.

The federal child labor laws are enforced by wage and hour compliance officers stationed across the U.S.

Additional information on child labor restrictions and hazardous occupations is available from local offices of the Wage and Hour Division, listed in most phone directories under U.S. Government, Department of Labor, Employment Standards Administration.

Betty Hayes is an information officer with the Employment Standards Administration, U.S. Department of Labor.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1980 O—311-407/6

BLS Periodicals

Provide timely information on Employment, Occupations, Wages, and Prices

U.S. Department of Labor

Bureau of Labor Statistics

CPI Detailed Report... is the most comprehensive report on monthly consumer price indexes and rates of change. Includes data on commodity and service groups for 23 cities. **$15 a year.**

Current Wage Developments... reports on specific wage and benefit changes from collective bargaining agreements. Includes data on strikes or lockouts, major agreements expiring, and statistics on compensation changes. **$12 a year.**

Employment and Earnings... gives current employment and earnings statistics for the Nation as a whole, for individual States, and for more than 200 areas. Included are household and establishment data, seasonally and not seasonally adjusted. **$22 a year.**

Monthly Labor Review... the oldest and most authoritative Government research journal in economics and social sciences. Regular features include reviews of books, developments in industrial relations, labor cases. **$18 a year.**

Subscriptions to BLS periodicals are available from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402. For subscriptions to foreign countries, add 25 percent to all prices. Make all checks payable to the Superintendent of Documents.

Producer Prices and Price Indexes... includes price movements of industrial commodities and farm products, processed foods and feeds. Tables and charts give greater detail than available in other published material. **$17 a year.**

Occupational Outlook Quarterly... helps students and guidance counselors learn about new occupations, training opportunities, salary trends, and career counseling programs. Written in nontechnical language and illustrated in color. **$6, four issues.**

Alcoa

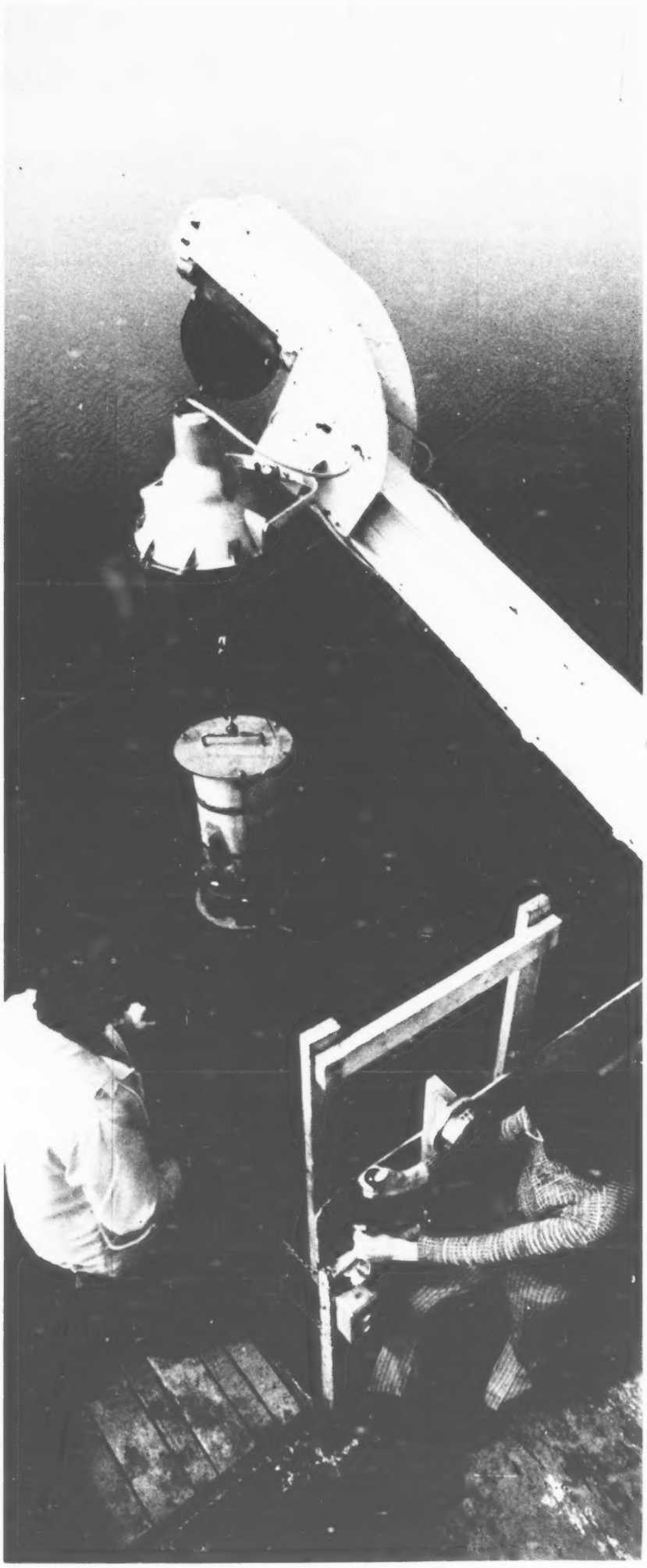
Environmental Engineering

The growth of environmental engineering has been spurred on not only by public concern over environmental pollution but also by several major Federal laws: The Clean Air Amendments of 1970, the Occupational Safety and Health Act of 1970, the Federal Water Pollution Control Act, the Noise Pollution Control Act, the Environmental Pesticides Control Act of 1972, and the Toxic Substances Control Act of 1976.

The earliest environmental engineers were called sanitary engineers and their duties were much more limited than their present-day counterparts. Environmental engineers of today must understand the fragility of the environment and the hazards that toxic chemicals and waste products present to people and the environment. Environmental engineers design, operate, or manage facilities and systems for environmental protection. They may do fieldwork—testing air quality, for example. Other problems they deal with include the storage and transportation of chemicals, emergency procedures following chemical spills, and recordkeeping requirements related to environmental problems.

Most positions in environmental engineering reflect the interdisciplinary nature of the field and the training given to graduates of environmental engineering programs. But, most environmental engineers work in one or more specific areas. A review of some positions shows these specialties.

- Air pollution control engineers are concerned with fuel, combustion, and cleaning of exhaust gases from combustion. Besides pollution from factories, air pollution control engineers may work to decrease pollution from aircraft, marine craft, trains, highway vehicles, and power plants.
- Radiological health engineers deal with dangers of radiation from nuclear plants, X-ray machines, and radioactive tracers.
- Industrial hygiene engineers concentrate on protecting people from physical, chemical, and biological hazards in the work environment. They assess imminent hazards and use engineering devices as means to alleviate or eliminate them.
- Solid waste engineers seek out efficient ways to dispose of solid wastes. They develop and supervise methods for waste disposal including the use of some wastes as alternate fuel in power plants and the recovery of glass and metals.
- Sanitary engineers are concerned with providing good water for cities and industries and disposing of waste water. This field has been recognized as a major sub-branch of civil engineering for almost 100 years.
- Water pollution control engineers are primarily concerned with the control and use of water and the development of water supplies. They work with the development of water resources and with the conservation and wise use of these resources. Consequently, they may be asked to assess the effects of water-oriented recreation on the preservation of wildlife, open space, and unique scenic attractions.
- Environmental compliance engineers usually enforce regulations for Federal, State, and municipal agencies. They obtain and test air, water, or soil samples and gather other physical evidence of violations. They may have to give professional opinions in legal proceedings.



Environmental Protection Agency

Besides the government and private industry, environmental engineers work for consulting companies doing a wide variety of tasks, including a new specialty—writing environmental impact statements. They also work for equipment manufacturers to develop and market cleaning devices, waste-water treatment equipment, environmental control devices, and monitoring devices. Other environmental engineers work for research establishments, educational institutions, and health agencies.

According to a survey taken by the Association of Environmental Engineering Professors, the salary range for new M.S. and Ph.D degree holders in environmental engineering in 1978 was $18,660 to $24,000 annually, depending on experience.

More than 200 colleges award B.S., M.S., and Ph.D. degrees in environmental engineering. Many other colleges offer curriculums in closely allied fields such as biology, biochemistry, ecology, oceanography, industrial hygiene, health physics or radiation protection, and safety engineering. In 1978, the Engineers Joint Council reported that 269 students graduated with B.S. degrees in environmental and sanitary engineering, 521 with M.S. degrees, and 36 with Ph.D.'s.

According to the Environmental Protection Agency (EPA), employment opportunities are available for environmental engineers at all levels. The number of job openings, says EPA, is 2 to 5 times greater than the number of graduates each year. The outlook for the 1980–85 period, unless Congress or the States make drastic changes in existing legislation, is also good.

There are several useful publications available on careers in environmental engineering. The following brochures on careers in environmental engineering are available from the addresses listed:

"Career Opportunities in the Environmental Protection Agency"
EPA
Research Triangle Park, N.C. 27711

"Working Toward a Better Environment: Career Choices"
Career Information
Office of Education and Manpower Planning
EPA
Washington, D.C. 20460

"Careers in Water Pollution Control"
Water Pollution Control Federation
3900 Wisconsin Ave. N.W.
Washington, D.C. 20016

"Engineering for Ecology"
American Institute of Chemical Engineers
Environmental Division
345 East 47th St.
New York, N.Y. 10017

"So You Want To Be An Environmental Engineer"
Association of Environmental Engineering Professors
c/o Dean's Office, College of Engineering
Utah State University
Logan, Utah 84322

"The Environmental Engineer"
American Society of Civil Engineers
345 East 47th St.
New York, N.Y. 10017.

Biomedical Engineering

Biomedical engineering was formerly known as bioengineering. Bioengineering, as a discipline, began generations ago when engineers first devised technology to help solve medical problems. The work of biomedical engineers is changing and expanding all of the time. Some recent examples of these changes include using lasers in surgery, devising vein grafts for vascular reconstruction from processed veins made of human umbilical cords, and developing microelectronic implants.

The main specialties of biomedical engineering include bioengineering, clinical or hospital engineering, and medical engineering. Bioengineers apply engineering concepts and technology to advance the understanding of biological systems, including the structure, function, and performance of the human body in health and disease. One goal of the profession is the improvement of the environment and the protection of human, animal, and plant life from pollutants and toxicants. This subspecialty often is referred to as biotechnology or bioenvironmental engineering.

Research bioengineers work closely with physical and life scientists in a laboratory or university; they themselves must be competent in the life sciences as well as engineering. Much of their work entails experiments involving mathematical analysis and computer simulation of the system being studied.

Medical engineers develop instruments, materials, diagnostic and therapeutic devices, computer systems, artifical organs, and other equipment needed in biology and medicine. Medical engineers need the skills of the electrical, mechanical, or chemical engineer, in addition to knowledge of the life sciences and of all Federal and State laws about medical devices.

Clinical engineering is the newest area of biomedical engineering. A main goal of clinical engineering is better patient care with minimum cost. Clinical engineers use technology to improve health care delivery systems in hospitals, clinics, government installations, universities, and industry. Clinical engineers, for example, may use computers to monitor patients in an operating room or intensive care unit. They may be responsible for maintaining and repairing instruments and for developing ways to analyze data. Besides sound engineering skills, clinical engineers should have good management and communication skills. Certification and licensing of clinical engineers are becoming common.

Biomedical engineers in any of the three divisions may specialize in practice, research, teaching, consultation, or management. They work for colleges and universities, industry, health care institutions, and government agencies. Industries employing biomedical engineers include the areospace, pharmaceutical, electronic and mechanical instrument, medical devices, hospital supply, and computer industries. Among Federal agencies, biomedical engineers work for the National Aeronautic and Space Administration, the Food and Drug Administration, the Public Health Service, and the National Institutes of Health.

More than 121 colleges and universities offer courses in biomedical engineering and at least 49 offer one or more degrees in the field. Nine of these programs are accredited by the Accreditation Board for Engineering and Technology. The reputation of the biomedical engineer with a B.S. is just being established. Supporters of the B.S. program maintain that many jobs neither require nor can pay the salary of an engineer with an advanced degree.

National Institutes of Health, photo by Jerry Hecht

Department of Health, Education, & Welfare

A traditional route of entry for biomedical engineers is through a master's degree program. Over 40 colleges and universities offer graduate degrees in biomedical engineering. Usually, the biomedical engineering M.S. candidate will have a B.S. in engineering in one of the traditional disciplines, although some major in the life sciences. Electrical engineers are often well suited for instrumentation development, mechanical engineers may be qualified for biomaterials and prosthetic devices, and chemical engineers may gravitate towards specialties in transport processes—such as renal dialysis or cardiopulmonary systems.

A master's degree in clinical engineering is usually desirable since the work requires specialized knowledge. Formal course work for the M.S. includes medical instrumentation, computers in medicine, biomedical engineering analysis, clinical engineering practices, physiology, anatomy, biochemistry, and advanced engineering courses. Internships, which are normally required, take the form of a part-time work/study arrangement, credit for working under a practicing clinical engineer, or a regular internship in which the hospital hires and pays the student.

The oldest and most firmly established programs in biomedical engineering are at the Ph.D. level. Many, but not all, bioengineering positions require the Ph.D. degree, with a strong emphasis on the life sciences, or postdoctoral work in the field. To qualify for a Ph.D.–M.D. which about 12 schools offer, a student should have a B.S. in engineering and an outstanding academic record. The Ph.D. is normally completed in the first 4 years. The M.D. requires 2 years of medical school, a doctoral dissertation, and clinical internship.

Many schools that offer graduate programs in biomedical engineering report little difficulty in placing graduates. New Food and Drug Administration regulations of medical devices may provide new career opportunities at the master's and bachelor's degree levels in clinical testing and evaluation. Increased research funds could create new jobs in instrumentation and systems for delivery of health services. Some directors of biomedical programs note that the number of students seeking jobs in biomedical engineering has increased in recent years. They caution that even though graduates have had little trouble finding suitable employment in the past, it is difficult to predict the future course of events. According to the Occupational Projections and Training Data, Revised 1980, there were 4,000 biomedical engineers in 1978 and annual openings in the coming years will average 175; although employment is expected to grow faster than average, the actual number of openings will be small.

The Alliance for Engineering in Medicine and Biology has prepared several publications on the field. The Biomedical Engineering Education Directory is available for $1.50. A free brochure on careers entitled "Biomedical Engineering" may also be obtained by writing to the association. It's address is

Alliance for Engineering in Medicine and Biology
Suite 404
4405 East-West Highway
Bethesda, Md. 20014.

Fire Protection Engineering

Fire protection engineering has emerged almost unnoticed in the last two decades, although one college, the Illinois Institute of Technology, has had such a program since 1903. The need for fire protection engineers increases each year with construction of high rise offices, hotels, and residences; increased air and ground travel and transportation of hazardous cargo; and the growing awareness that public education can do much to prevent loss, death, and disability from fires that could have been prevented.

Fire protection engineers are employed by diverse companies and industries: Petrochemical companies, hospitals, airports, electrical contractors, government agencies, insurance companies, testing and certifying laboratories, trade associations, and transportation companies. The chief employers are the government, insurance companies, and manufacturers.

These engineers are engaged in a variety of tasks, primarily research, data analysis, and design. They develop equipment, write purchasing specifications, assist in the design and location of fire stations, evaluate water supply systems, and change fire protection codes and regulations.

Many fire protection engineers work for consulting companies. According to a survey done in 1977 by the Society of Fire Protection Engineers of its members, nearly 12 percent of the respondents were self-employed or worked in consulting firms. Al Gomberg, a fire protection engineer with the National Bureau of Standards, says of this group: "Of the many fire protection engineers who are consultants, the biggest complaint is that they can't handle all of the work that comes their way, such is the demand for their services."

"Many fire protection engineers start with insurance companies or industry because they offer an excellent chance to get experience," suggests Mr. Gomberg. According to him, the new graduate of a fire protection engineering program needs the experience which these employers offer.

According to the Society of Fire Protection Engineers, fire protection engineers earn as much or more than other engineers. Their median salary in 1977 was $25,018. In spite of the salary, fire protection engineers are still scarce. There are only about 3,000 nationwide, and only about 50 to 75 graduate from college each year. The Society of Fire Protection Engineers estimates 5,000 new job openings will be available in the next 5 years, with salaries starting at about $18,000 per year.

Al Gomberg cites yet another enticement of the field. He says: "It is an interesting field. It's almost a public service occupation since it can have a positive environmental impact. Unlike the civil engineer who is responsible for constructing a building, the fire protection engineer's work has a more direct impact on people."

Three undergraduate degree programs include Worcester Polytechnic Institute's Center for Fire Safety Studies which has recently developed a master's degree program; the Illinois Institute of Technology which expects to set up a master's degree program; and the University of Maryland which has an accredited program.

A B.S. in a basic engineering discipline together with a M.S. in fire protection engineering is an excellent back-

Engineering societies have helped by hosting career days in high schools, often making special efforts to include women engineers. The Society of Women Engineers has been active in this area, sponsoring career days and lectures and offering counseling. Thus high school girls looking for something different are made aware of engineering.

But probably the most dramatic push came from the ramifications of the so-called Women's Movement. Many women under 25 don't consider it a privilege to be admitted to engineering school, but a right earned by their talent and hard work. Women entering college in the 1970s are more aware of the possibilities open to them than were their predecessors. Today college women are more likely to choose a career on the basis of prestige, earning capacity, and interest than were women in previous eras. Why? They are likely to assume they will work for most of their lives. Thus, the hard work an engineering curriculum demands becomes a worthwhile investment when seen as a lifetime occupation.

Not that discrimination against women professionals in general, or women engineers in particular, has disappeared. The 1964 Rivil Rights Act prohibits discrimination on the basis of sex as well as race, but it was not actively applied to women until 1971, when A.T.&T. settled a multimillion-dollar discriminations suit brought by female employees.

Since then, the Equal Employment Opportunity Commission has charged hundreds of companies with bias against women and negotiated numerous Affirmative Action plans for women employees. These lawsuits and actions have made firms more aware of the potential of women.

Firms doing business with the government (including many engineering firms) must submit Affirmative Action forms during the bidding process. The list of professionals must include at least a few women, unless the firm can show it has tried in good faith to hire women and failed.

Once, hired, women engineers will generally find that the world of work is less hospitable than the academic world. Many male engineers are still not accustomed to working with women professionals. Many of the older engineers don't want to adapt to "girl engineers." Women sometimes must struggle for good projects, especially in smaller firms, and eventually for the right to manage projects.

Many women working in the South and Midwest or in small firms may well be the only women professionals in their companies. And being highly sought after and highly paid does bring problems. Most men of the same age can't help but resent a coworker being paid more because of her sex. Firms sometimes resent being forced to hire women and, to add insult to injury, being forced to pay them more. Finally, some women professionals find discrimination comes from the secretarial pool. Women often have more strictly stereotyped views of their abilities than do men.

Although the door is open for entry-level positions, there are still few women above middle-management level in any profession, and fewer still in engineering. Many women engineers who have been working 10 years or more feel that firms are still loathe to give women supervisory power over males. These women wonder if this resistance won't cause women engineers to "bunch up" in mid-management positions by 1985, with the new graduates pushing to get ahead and the older grads unable to make it through to top management.

Here are some words of advice for new women engineer graduates from women already in the field.

- Choose a first job that will provide a wide range of engineering experience. There are still firms that prefer tokens to workers. Be sure you understand the full range of responsibilities of your job. Be aware of the possibility of sexism on the job. It will likely be there in some form, from "girl" jokes to outright hostility. First, try to deal with problems humorously. Make an effort to grin and bear it through the harmless stuff. But don't hesitate to talk to your supervisor if you feel you are being sexually harassed, or if you feel your assignments are unequal to those of male coworkers.
- Watch out for overprotectiveness. Just as some men insist women work twice as hard to succeed, some men overprotect, assigning the hardest, dullest or dirtiest projects to male engineers. This gives your male peers a legitimate cause for resentment and limits your experience.
- Take responsibility and show initiative. Women must still work harder to demonstrate competence.
- Don't get stuck in one job for too long. Although there is no hard and fast rule, many women engineers feel that working up through the ranks at one firm is difficult for women. After your first few years, think of looking for a new job.
- Get involved in your professional society, at a local or national level. It is the best way to meet other professionals.
- Consider additional education. If your interests lie at the top, you will need management experience and probably a master's of business administration (M.B.A.) degree. Engineers with M.B.A.'s are currently in demand.

Women graduating in engineering today have cause to be grateful to the hard-won battles waged by their predecessors who have opened the doors to engineering. As recently as 1969, women engineers were told by recruiters that no one wanted women—they got married, they got pregnant—an all-round bad investment. Today a graduating woman engineer is probably turning down job interviews. In less than 10 years, the job market has swung from ignoring women to aggressively recruiting them. The result is today's great engineering womanhunt.

Number of Women Engineers

Women engineers still do not represent a large portion of the engineers in the U.S., nor even a significant portion of the women professionals. There are about 1.25 million engineers, of whom only 2.7 percent are women. And of the 4.18 million professional women (10 percent of the total number of working women: 41.8 million) only .8 percent (34,000) are engineers. Female enrollment in engineering school is significantly lower than in law, architecture or medicine (12 percent lower than law and architecture in 1974).

FRINGE AROUND THE PAYCHECK: EMPLOYEE BENEFITS

by Gail M. Martin

There was a time when fringe benefits meant exactly what the term implied: Something extra besides the paycheck—in some cases a nonessential "frill," such as discounts on the purchase of the employer's products. Today, fringe benefits encompass so many added bonuses that the term has become a misnomer. They include safeguards aimed at protecting workers and their families in case of economic disaster, whether from disability, sickness, unemployment, or death. The term "employee benefit" may better describe these bonuses, which have become an accepted part of American worklife. Americans have come to regard some of the basic benefits as economically essential. In fact, workers are sometimes willing to trade a portion of their pay increases for better retirement benefits, more paid vacation, and better medical benefits.

Employee benefits accounted for more than a fourth of an employer's 1977 payroll, according to the Bureau of Labor Statistics, and the cost of these benefits is moving upward. In the 11-year period ending in 1977, the average cost to employers for employee benefits rose by more than 200 percent, from 59 cents an hour worked to $1.87 an hour worked, while pay for time worked rose about one-half as fast. During the first quarter of 1980, the cost of benefits continued to increase more rapidly than wages.

Not all employees benefit equally from fringe packages, however. Benefits vary by industry, salary level, and, particularly, by employer. Sometimes union representatives bargain with management for the total compensation package—and especially the fringe benefits—on behalf of many employees at particular companies. Professionals and members of management often have to negotiate their own benefits.

Eligibility requirements, which differ from company to company, are the

---

Gail M. Martin is an OOQ staffwriter.

Chicago Mercantile Exchange

nel, who make up a large segment of the work force.

Paulek derives his estimate from the number of registrants in each of five categories that the CFTC regulates: Associated persons, floor brokers, futures commission merchants, commodity futures advisors, and commodity pool operators.

In 1979, associated persons accounted for the largest number of registrants and employees—a total of 34,648. Most were account executives, also referred to in the industry as brokers, solicitors, and registered commodity representatives. They give advice, solicit, or accept orders for purchase or sale of commodity futures contracts. Some have passed an exam administered by the National Association of Securities Dealers (NASD) and prepared by the Interexchange Examination Committee. Most brokers in the associated persons category work for futures commission merchants. According to account executives themselves, the job may take 2 years or more to learn after training.

There were 3,322 floor brokers in the United States at the end of 1979. Floor brokers, as their name implies, buy and sell contracts on the exchange floor. To do this, they, or, the company they work for, must own a seat on the commodity exchange. Floor brokers trade for commission houses, their customers, and other companies, usually on a commission basis. The CFTC registers floor brokers, but the exchanges themselves require that the floor brokers pass a test of rules and regulations of the exchange.

According to Paulek, 2,800 officers (executives such as Presidents, Vice Presidents, and Treasurers) work in the branch offices of futures commission merchants, together with at least four to five support personnel for each officer. A rough estimate for the number of employees of futures commission merchants is 13,000 workers, who make up a large part of the work force of the industry.

Commodity trading advisors, numbering 1,114 at the end of 1979, can be either companies or individuals who give advice on the markets. For example, the publisher of a commodity futures market newsletter is classified as a commodity trading advisor. There are no examination requirements for these advisors. Also, as required by the Commission, each advisor must keep records of clients' names and addresses, written recommendations, market transactions of the advisor and his or her principals, discretionary accounts, powers of attorney, and client agreements. Some advisors also are required to furnish clients a general disclosure statement.

Commodity pool operators may also be individuals or companies. Their main function is to pool money to buy contracts. They solicit funds or property for an investment trust or syndicate. They are required to furnish prospective participants a disclosure statement delineating their background, the risks of futures trading, pool trading strategies, and goals and rights of participants. Furthermore, they are required to prepare income and expense and cash receipts and disbursement records and to record market positions taken by the pool. There were 679 commodity pool operators in 1979.

Associated Persons: Account Executives and Brokers

"The commodity futures contract industry is like a giant poker hand," Bill Paulek says, "that has to be settled every day." To settle up every day requires a specialized work force, not the least important member of whom is the account executive or broker. CFTC requirements and exchange regulations involve the broker in a certain amount of daily paperwork. Most brokers know generally what their duties are from studying for the exam given by NASD. While preparation for this exam is one way of learning enough to function in the business, industry experts suggest that it is just the beginning of preparation.

Many large brokerage houses have training programs for commodity futures brokers. Some trainees are chosen from company employees and others are recruited on college campuses.

According to Jim O'Donnell, Commodity Training Manager for Merrill, Lynch, Pierce, Fenner and Smith, his company employs about 600 commodity brokers nationwide and trains about 150 per year. He says, "They come from all walks of life. We take former stock brokers but also computer sales representatives, lawyers, and college professors. It all depends on the person's potential to sell complex products." According to O'Donnell, most trainees are college graduates. They generally have business experience or they have a unique background in a particular commodity, such as an agricultural economist would have.

Similar types of people are chosen by Conti Commodity Services, Inc., a subsidiary of Continental Grain Company, which employs over 300 commodity brokers nationwide. According to Linda Vargo, personnel specialist for Conti, the prerequisites for broker training positions are stiff. Trainees

Chicago Mercantile Exchange

must have owned their own business, have a successful sales record or a financial background—via work in a loan office, bank, or financial institution—or be a college graduate with an economics major. Trainees need such personal qualities as initiative and adeptness at presenting themselves and their products.

Both Conti's and Merrill Lynch's training programs include classroom instruction and work in their branch offices. Conti brokers cross-train in all commodities but subsequently develop specialty areas. Merrill Lynch brokers cross-train in various commodities and usually specialize in a group of commodities.

Besides understanding Federal and exchange regulations and the required paperwork, brokers must be thoroughly familiar with and experienced in all facets of the business. They must understand charts and technical analyses of each commodity market and also the fundamental factors leading to price movements. Brokers must know how to integrate and use the information which commodity and technical analysts provide.

Further preparation for understanding trading and working as a commodity broker is offered in the Futures Industry Association (FIA) correspondence course, which is often included in company training programs. *The Commodity Trading Manual* of the Chicago Board of Trade is a basic handbook, which is used almost universally in the industry. The FIA correspondence course covers topics which help brokers understand the mechanics of trading. The subjects include CFTC and exchange rules regarding margins, opening accounts, daily trading limits, reading commodities prices, the crop year, types of commodity orders, writing and placing commodity orders, daily settlement of accounts, deliveries, and market information.

Support Personnel

Brokers are assisted by professionals who have unique expertise and provide important statistics and information. This research is so important that one company alone has four research centers. Chief among professional support and research personnel are commodity research analysts, technical analysts, and commodity specialists.

"Commodity research analysts issue internal recommendations for their company, prepare charts, and write reports," says Pam Fulcher, commodity research analyst for Heinold Company in Chicago. They gather and analyze information on supply and demand for each of the commodities they follow. They keep track of the fundamentals to make supply and demand and price estimates. One company, E. F. Hutton, even has a full-time meteorologist to help the commodity research analyst keep track of worldwide weather conditions.

Fulcher has a bachelor's degree in economics. She had no academic training in agriculture although the company she works for deals in livestock. She began by doing similar analysis work for another company. She says, "Basically, the economic principles are the same, although the fundamentals that affect supply and demand vary with each commodity. The work is very interesting since the market is constantly changing, and it requires you constantly to learn and study more."

Technical analysts formulate trading recommendations based on technical analysis that is much different from the fundamentals approach of commodity research analysts. The technical analysts's approach to forecasting commodity prices is based on the study of price movement itself without regard to underlying fundamental market factors. Rather, they look at price movement in relation to time. Some approaches to technical analysis include identification of key chart configurations, use of moving averages, and construction of trend lines. Technical analysts make written recommendations based on their analysis of technical data on a daily and weekly basis.

Technical analysts are often assisted in their work by electronic equipment that details current price action. Some companies also have professional charting departments to provide current and historical records of price action. Many technical analysts prepare for their work by studying economics in college.

Commodity specialists provide marketing support and information, formulate and disseminate short- and near-term trading suggestions, and deal with some customers. Commodity specialists are thoroughly familar with one or more commodities by virtue of education, experience, or both. They understand the futures market for each of their specialties, as well as the cash or spot market. Commodity specialists, like commodity research analysts, have the use of resources such as newsletters and the findings of research companies under contract to their employer.

Besides commodity research analysts, technical analysts, and commodity specialists, brokerage houses need the assistance of lawyers in increasing numbers. According to one industry observer, the demand for experienced

OOQ

Occupational Outlook Quarterly

U.S. Department of Labor
Bureau of Labor Statistics
Fall 1980

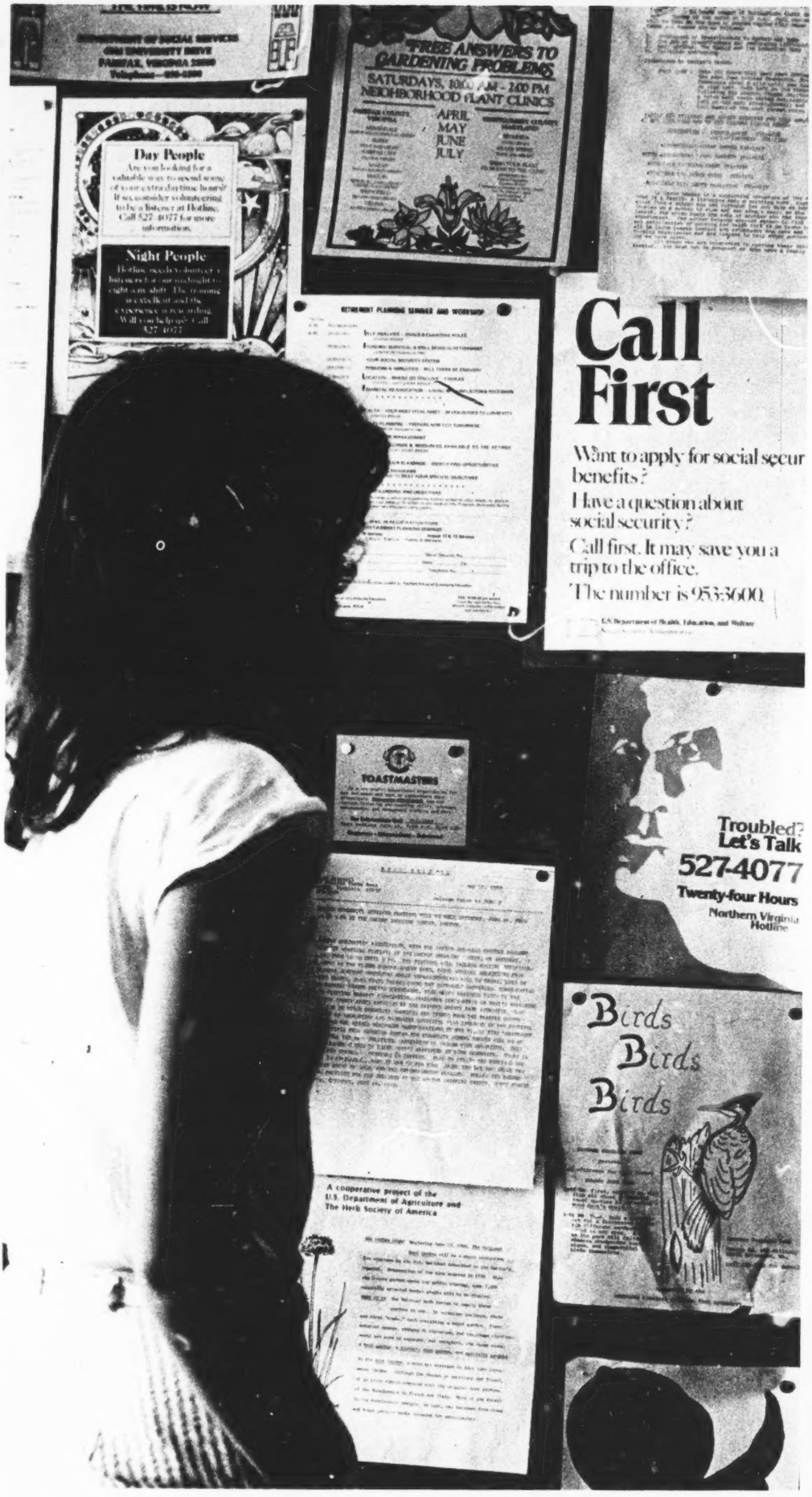
In This Issue: The Job Market for Teachers in the 1980's

Periodicals

The periodical section of most libraries contains much useful information on jobs and careers. Trade journals and professional magazines provide current information. Besides these publications, more popular periodicals regularly feature articles on careers and job hunting. Getting a job and getting ahead in the working world are frequent topics. Even if the local library has a limited supply of trade or professional publications, it will very likely have a good supply of popular magazines. In addition, periodicals have the advantage of being more timely than books or other reference materials. Some magazines feature articles on careers, training, aptitude testing, applying for jobs, and opportunities in small business for all jobhunters. Others such as *Working Woman* or *Black Collegian,* are geared toward specific groups.

For specific career fields or topics, jobseekers may wish to use the *Reader's Guide to Periodical Literature* or a newer index carried by many libraries, the *Magazine Index.* For more business-oriented articles, the *Business Periodicals Index* may be appropriate. Newspapers are often included in the periodical section of the library. Besides local daily and weekly newspapers, libraries often carry special newspapers, like *Barron's,* and out-of-town metropolitan dailies. The *Newspaper Index* can help with the search for specific information from newspapers. Libraries that can't afford a large collection of newspapers may nevertheless have the classified advertisement section from the Sunday edition of large newspapers such as the *N.Y. Times* or the *Washington Post* for job hunters.

The periodicals department may also file newsletters from various organizations and community agencies. These frequently list job vacancies for county or federal government. Commercial newsletters which list job openings are also finding their way into more and more libraries. Look for the *Federal Research Service* and the *Federal*



Jobs Newsletter which are published every two weeks in alternate weeks, and list job vacancies in the federal government.

Books

Looking for books in the library collection will take patrons to many sections of the library. Bibliographies are especially helpful, but if they're not available patrons can make their own bibliographies tailored to meet their individual needs. The place to begin is at the card catalog. Jobseekers might want to look up books recommended by friends or found in bibliographies of books they've read.

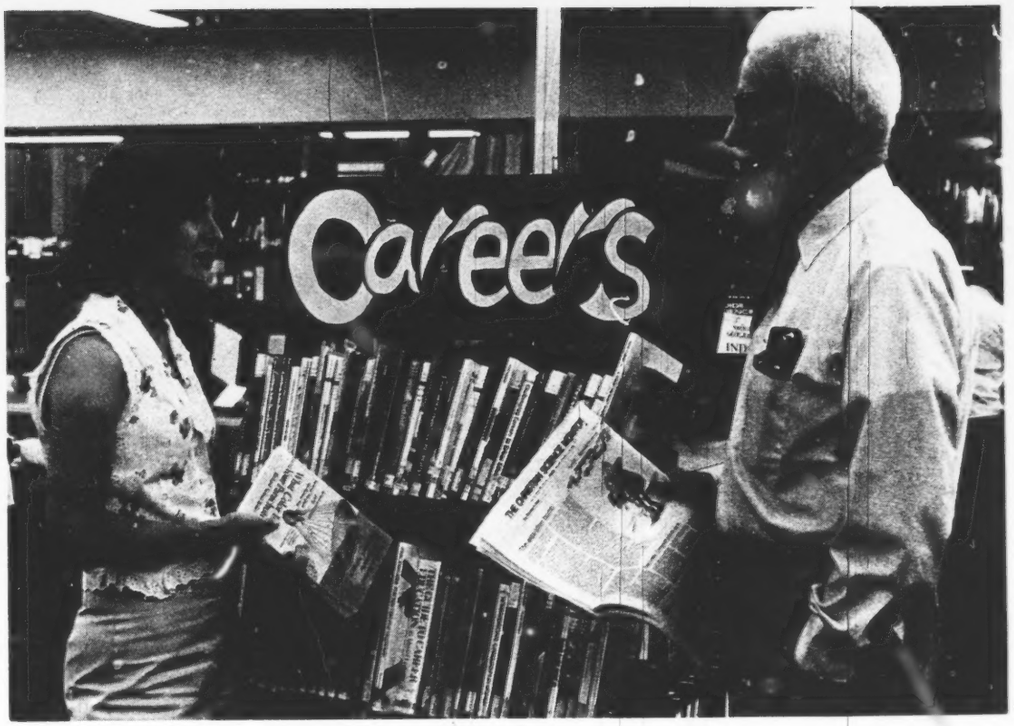
Some books in the library collection are general. Some of these in the general category are job hunting guides, vocational training and occupational training books, self-employment books and books on specific career fields. Biographies and autobiographies can also be important sources of career information: Books such as Dennis Smith's *Report From Engine Company No. 82,* are rich with details of exactly what the work is like.

The OOH is likely to be found in the card catalog of most libraries. Patrons should be aware that circulating copies are usually the older editions and salary and statistical information may no longer be current. For the latest edition, the patron should ask the librarian.

Books in more specific categories also may be found, such as books on preparing for employment tests, interviewing for jobs and writing résumés. The librarian can also be helpful in recommending books. There are many subjects under which books on employment and finding a job may be listed. Patrons can look under specific career title, or a specific topic. Again, consult the librarian because new books on careers and job hunting are published all the time. In a special section for new arrivals, the library may have new books not yet listed in the card catalog.

Without a book title or author, patrons may have difficulty finding the exact subject heading for the books they need. It is wise to try several headings to locate the best selection. A comprehensive list of subject headings can be found in *Sear's List of Subject Headings* or the *Library of Congress Subject Headings.* These give synonyms of subject titles related to jobs and employment. Some suggested subject headings for books on occupations and job hunting are listed below.

- Affirmative action
- Applications
- Apprenticeship
- Business etiquette
- Careers
- Civil service
- Discrimination
- Earnings
- Employers
- Employment
- Employment agencies
- Employment opportunities
- Employment problems
- Employment tests
- Equal employment
- Executives
- Fair Labor Standards Act
- Grooming
- Industry
- Job hunting
- Job satisfaction
- Job search
- Jobs
- Jobseekers
- Labor movement
- Management
- Occupational outlook
- Pay
- Performance
- Personal development
- Professional development
- Professions
- Recruiting
- Resumes
- Self employment
- Trade unions
- Vocational training
- Women
- Work



Reference

An important section in the library for jobseekers is the reference division, which has many valuable books that individuals couldn't afford or comfortably keep. Many reference books, depending on the interests and needs of the job hunter, may prove extemely useful. The needs of the person seeking labor market information will be different from those of the person exploring careers.

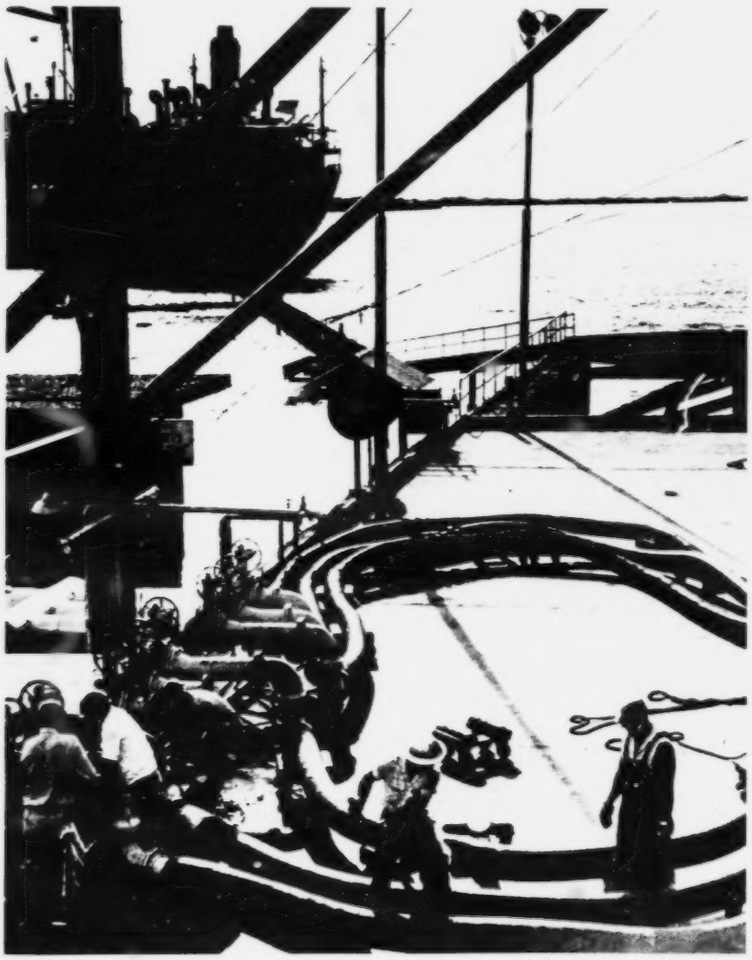
Again, the librarian can offer help by directing patrons to the proper sections in the reference collection and pointing out new guidebooks or directories which may be of particular use. In many cases, if the library does not have a specific reference book or index, the librarian can suggest an equally good substitute. Also, the librarian may be able to point out any reference books which are designed for specific groups. For example, the reference collection may have special books for women reentering the world of work, such as the *Women's Guide to Career Preparation, Scholarships, Grants, and Loans,* by Ann Jarvin.

Jobseekers use the reference section to get many kinds of information, including information on company executives. For such help

ground for this career field, since a good fire protection engineer needs some understanding of mechanical, civil, and electrical engineering; architecture; water supply technology and management; and the combustibility of materials.

Some companies are so anxious to get good, well-trained fire protection engineers that they offer scholarships to undergraduates. For more information on careers in the field and the addresses of local chapters write

Society of Fire Protection Engineers
60 Batterymarch St.
Boston, Mass. 02110.



Exxon Corporation

Ocean Engineering

Ocean engineering, which began in the early 1960's, developed as a result of a growing awareness of the resources of the sea: Offshore oil supplies, tidal power, the products of mariculture, and an economical transportation route. Formal programs were given boost by the National Sea Grant College and Programs Act of 1966, which emphasized research and education in the wise use of our oceans.

Ocean engineers generally are specialists since the field is rather broad. Specialities include ocean structure design and analysis, materials and corrosion, underwater acoustics, offshore petroleum engineering, coastal engineering, ocean thermal energy conversion, ship hydrodynamics, ocean mining, fisheries engineering, and others.

Employers of ocean engineers include the defense industry, particularly contractors who design and build sonar systems. Engineers are needed by local, State, and Federal agencies and consulting companies. Ocean engineers also work for oil companies in design departments, on offshore rigs, and as supervisors.

For 30 years, ocean engineers have been involved with extracting petroleum from the continental shelves of the world. But, recently, expanded oil exploration and recovery have expanded to areas that have tested ocean engineering technology. In the North Sea and the Gulf of Mexico, companies have reached record depths. Ocean engineers have been called upon to design structures, particularly for the North Sea, that are capable of withstanding extemes of cold, wind, and waves.

Ocean engineers are also involved in projects to adapt navigation channels for deep draft tankers and cargo vessels. To determine whether a channel should be deepened, a new terminal built, or another solution sought, ocean engineers analyze currents, sediment transports, and the effects of extreme weather. In addition, the ocean engineer must consider the ecological impact of any changes made to the natural environment.

Another major area of ocean engineering focuses on coastal resources management. Ocean engineers assess the feasibility of all forms of coastal construction: Mooring and docking facilities, bridges, and dams. They give advice on ways to stem shoreline erosion, taking into account the natural landscape and ecological balance.

New specialties in ocean engineering are still emerging. Ocean engineers are active in ocean thermal energy conversion. They work on the design, construction, and testing of heat exchanger systems for converting the thermal resources of the ocean to energy. Ocean mining of manganese nodules and other mineral recovery work has begun recently. Also under investigation is the use of new technology to obtain food from the sea—mariculture. It is also hoped that in the future, ocean engineers will be involved in using the oceans for disposal, waste assimilation, and recycling.

According to Dr. I. B. Davidson, Director of the Department of Ocean Engineering at Florida Atlantic University, the starting salaries of B.S. graduates from F.A.U. in 1978 averaged $16,000 to $18,000 per year. Ocean engineers with M.S. degrees started at $22,000 to $23,000.

At least 16 colleges, universities, or institutes offer undergraduate and graduate programs in ocean engineering. Seven are accredited programs on the B.S. level. Some of these undergraduate programs feature cooperative education arrangements. Although the co-op programs require 5 years to complete, the starting salary offers to graduates of these programs are frequently higher, according to Dr. Davidson. Many of the institutions offering ocean engineering programs are Sea Grant Institions or members of State university systems that participate in the Sea Grant Program. For a complete list of programs, write for a copy of "University Curricula in the Marine Sciences and Related Fields" from

Director
Office of Sea Grant
NOAA
6001 Executive Blvd.
Rockville, Md. 20852.

Los Alamos Scientific Laboratory

Energy Engineers

As our country strives to meet the goal of energy independence, more professionally trained engineers specializing in energy will be needed. The National Association of State Universities and Land Grant Colleges reported that of the 58,000 engineers graduated last year, about 12,000 chose careers in energy-related areas. Furthermore, the association reported that estimates for one program alone—President Carter's synthetic fuels proposal—would require roughly 25,000 additional engineers over the next 10 years.

The nuclear energy industry plays an important part in meeting the Nation's energy goals. According to a survey done by the Bureau of Labor Statistics (BLS) in the Fall of 1977 for the Department of Energy, more than 40,000 engineers were employed in the industry. By specialty, there were 2,401 chemical engineers, 3,829 civil engineers, 7,799 electrical and electronic engineers, 11,544 mechanical engineers, 1,153 metallurgical engineers, 5,647 nuclear engineers, and 8,473 other types of engineers. Engineers, scientists, and technicians made up approximately 45 percent of the nuclear industry work force.

Engineers in the nuclear energy industry may specialize in many different areas of technology or application. Some of these areas include instrumentation and control, reactor analysis, fuel management, energy conversion, fast breeder reactors, computer applications, radioisotope applications, and materials.

Over one half of all engineers working in nuclear energy are engaged in research and development. But job opportunities abound in several other areas of the industry. For example, many chemical engineers are employed in the preparation of reactor fuel and refining and enriching uranium. Mechanical engineers and those specializing in reactor technology work in the reactor manufacturing segment of the industry, which makes intricate components such as fuel elements, control rods, and reactor cores. Engineers make up one third of the work force employed in reactor manufacturing.

Reactor operations and maintenance employs not only mechanical but also electrical and electronic engineers. According to a BLS report, "Technological Change and Its Labor Impact in Five Energy Industries," published in 1979, shortages may develop for nuclear, mechanical, and electrical engineers required in constructing and operating nuclear powerplants.

The expertise of engineers employed in the nuclear energy industry carries them into many different fields. Some of these areas include the development of nuclear power for ships, the application of radiation in the diagnosis and treatment of a great variety of diseases, the use of nuclear energy to reduce environmental pollution from fossil fuels; the use of radiation for measuring low levels of pollutants; and the development of nuclear power plants that not only produce power but also desalinate water.

Besides nuclear powerplants, some of the employers of nuclear engineers and other engineers with expertise in nuclear energy include electric utilities, petroleum companies, government research labs, architectural engineering firms, nuclear reactor manufacturers, electric utility equip-

key to whether an employee and dependents receive benefits at all and for how long. At some companies, the employee is eligible for some or all benefits from the first day on the job. At other companies, employees can accrue benefits after a few weeks of service; at others, only after several years of service. Another crucial aspect of eligibility comes with termination of the job: Are benefits forfeited immediately with termination or will some carry over for a time? At some companies, if employees leave, they forfeit all benefits. Medical coverage is a benefit employees might be concerned about continuing at least until new coverage becomes effective. Some companies may offer a grace period while others may offer employees the option of continuing medical insurance on their own but at a higher rate.

Benefits, like pay scales, may vary from region to region within the country. Unless employees are part of a union or are executives, they may actually have very little say as to the range or quality of benefits offered. Yet, it pays to know what the benefit programs are all about and what your rights are.

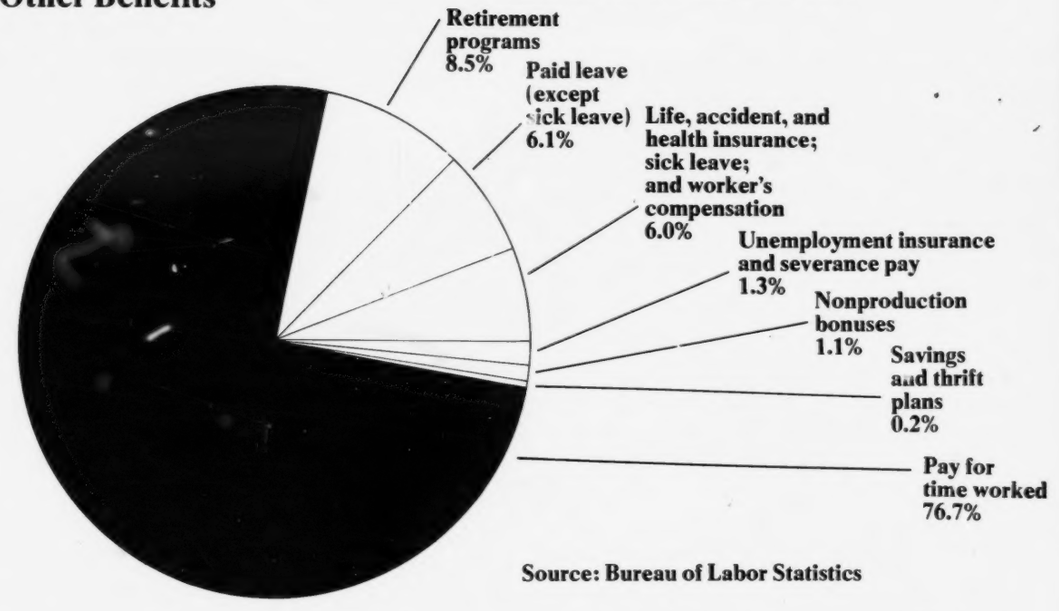
Basically, employee benefits fall into three categories: Statutory (required by law), compensatory, and supplementary. Some compensatory benefits also are required by law. Most are given at the discretion of the employer; but their number and kind may vary widely from employer to employer.

Since statutory benefits are required by law, they are fairly uniform from place to place. Included are social security benefits (FICA), Federal and State unemployment insurance, and workers' compensation insurance. These benefits are designed to protect the employee's income in the case of layoff, injury, or death on the job. These programs can be quite costly to the employer, although deductions from the payroll for social security taxes come from employees also. While States have separate laws to govern unemployment and disability insurance, the programs themselves are administered cooperatively by the Federal Government and State governments.

For more information, write for a free copy of "Unemployment Insurance: How It Works for You" from Consumer Information, Pueblo, Colorado 81009. For information on the Federal social security system write for a free publication "Your Social Security" at the above address. For a statement of earnings, employees may write directly to the Social Security Administration at P.O. Box 57, Baltimore, Maryland 21203.

Dividing Up Pay and Other Benefits

Pay and other benefits as a percentage of total compensation for all employees in non-farm industries, 1977


Retirement programs 8.5%
Paid leave (except sick leave) 6.1%
Life, accident, and health insurance; sick leave; and worker's compensation 6.0%
Unemployment insurance and severance pay 1.3%
Nonproduction bonuses 1.1%
Savings and thrift plans 0.2%
Pay for time worked 76.7%

Source: Bureau of Labor Statistics

Compensatory benefits are wages paid for time not worked. They include vacation time, holidays, sick leave, coffee breaks, rest periods, leave for marriage, birthdays, funerals, and jury duty. Other compensatory benefits include severance pay, sabbaticals, and leave for education.

The number of paid holidays is growing rapidly, and the use of floating holidays is becoming increasingly popular. Under this plan, employees substitute a day off of their choosing for holidays worked.

Another new trend in compensatory benefits is the use of sick-leave banks. Under this system, employees pool their sick leave to form a bank from which any employee who needs additional sick leave can draw. This benefit incurs no additional expense for the employer and reportedly has discouraged absenteeism in companies that have initiated the plan.

Supplementary benefits most commonly include health insurance, life insurance, retirement or pension funds, and investment or savings plans. A host of other supplementary benefits are offered by employers. The list on page 19 gives some examples.

Medical insurance is one of the most important and costly benefits provided by employers. A U.S. Chamber of Commerce survey found employer payments for life, hospital, surgical, and medical insurance averaged $14.62 a week per employee in 1977, a 264-percent increase over the amount paid 10 years earlier.

Some employers pay the total premium for medical insurance coverage, but many contribute partially and the employee pays the remainder. Usually, the employee becomes eligible for benefits after a nominal period of time, typically 2 weeks to 1 month. Some plans have been expanded to include dental coverage and mental health benefits.

Pension plans, or retirement funds, are now covered by legislation, the Employee Retirement Income Security Act (ERISA) of 1974, although the law does not mandate that an employer offer a plan. The law says that workers are entitled to written statements telling how much money has been contributed to the plan, who is eligible for benefits, when eligibility begins, when and how benefits can be collected,

what happens when a worker leaves the company, and other facts. An important provision, vesting rights, assures that eligible employees may collect a share of pension fund assets if they leave the company before reaching retirement age. For information on ERISA write for "What You Should Know About the Pension and Welfare Law." It's free and available from Consumer Information, Pueblo, Colorado 81009.

New Measure Includes Benefits

Payments in the form of employee benefits are becoming a bigger part of employers' total expenditures. Accordingly, the Bureau of Labor Statistics has devised a new index to reflect changes in total compensation: The Employment Cost Index (ECI). It is a measure of changes in the cost of wages and benefits to the employer. Thus, the new index more closely reflects the true change in the cost of labor than when wages alone are measured.

Counseling services are becoming a common supplementary benefit. Preretirement counseling and advice on financial planning also may be offered. Some companies employ certified benefit advisors to help employees decide on appropriate investment and savings plans. Among options discussed are government bonds, company stock, annuities, long-term fixed income funds, and mutual funds. Financial programs can be complex to administer, and are most commonly found in larger corporations.

Educational assistance is a popular supplementary benefit. Some companies pay employee tuition in continuing education courses; others offer low interest loans and scholarships to employees or their children.

Credit unions are sometimes considered part of supplementary benefits. Besides offering a favorable interest rate for savings, they may offer loans at low interest rates for a down payment on a home, tuition for college, and new automobiles.

Other supplementary benefits include the use of company facilities at little or no cost. Company cafeterias, day care centers, recreational facilities, parking facilities, and company cars are some examples. Use of these may save sizeable sums of money each year for some employees. Discounts on merchandise are offered frequently to persons working in retail business. Similar benefits are offered to workers in other industries. Airline employees, for example, receive considerable travel discounts. Other benefits include cut-rate telephone services for telephone company employees, free or discount tuition for children of university personnel, and overdraft privileges for bank employees.

Recently, some companies have established flexible compensation programs. These are also called cafeteria programs, since employees are allowed to pick and choose among a variety of supplementary benefits. Flexible benefit plans usually consist of a certain core of basic benefits that everyone gets. Employees are allowed to choose additional benefits that meet their needs. So far, only a small number of companies have experimented with flexible compensation plans, since they are expensive to administer.

Some companies have also experimented with prorating benefits for part-time workers. Benefits are extended to part-timers according to the hours worked. It is not possible to prorate benefits in the statuatory benefits category, but most supplementary benefits can be prorated along with compensatory benefits. For example, medical insurance could be prorated to

- provide a proportion of various components,
- provide some components but not others,
- limit coverage to individual workers but not family.

The company could also offer group plans to part-timers if above options are not feasible.

Fringe benefits can also be intangible. For example, a job with an opportunity to meet competent professionals in the same field may enhance an employee's career development. Or, a company's policy on flexible working hours may allow a new mother or father to continue working after the birth of a child. These kinds of fringe benefits have no face value but may prove very valuable at a later date.

Employee benefits, both monetary and otherwise, no longer make up the fringe around the paycheck. Rather, they represent a substantial form of renumeration and one which no employee can affort to ignore.

Other Supplementary Benefits

Annual medical check-ups
Athletic leagues
Career counseling services
Cash bonuses
Club membership
Company cafeterias
Company cars
Company hospitality suites
Company libraries
Conferences and convention expenses paid
Credit cards for business use
Credit unions
Day care
Dental insurance
Employee discounts on products or services
Employment agency fees paid
Eyeglass or drug plans
Expense accounts
Executive dining rooms
Financial counseling
Flexible hours/four-day workweek
Free parking
Free tuition for spouses and dependents of university faculty and staff
Group automobile insurance
Health units and services
Income tax counseling
Life insurance
Medical insurance
Mental health counseling
Moving allowances
Overdraft privileges and low-interest loans for bank employees
Pension plans
Pre-paid legal services
Pre-retirement counseling
Professional association dues paid
Recreational facilities
Profit sharing
Sabbatical or educational leave
Savings bond deductions
Scholarship programs
Season's tickets for sports or cultural events
Settlement or closing costs for homes
Severance pay
Stock purchase options
Training programs
Transportation expenses of interviews
Transportation on company planes or jets
Travel discounts
Tuition payments

commodities lawyers in private firms and for in-house counsel at each of the exchanges, brokerage houses, banks, and commercial users of the market has spiralled.

Dennis Cameron, Director of Compliance for Stotler and Co. and former administrator at the Chicago Board of Trade, remarks, "Ten years ago there were only about 10 to 20 lawyers in the country who could handle cases concerning commodity futures contracts; now most big brokerage firms have law departments." He says that persons with master's degrees in legal fields are also in demand.

Ronald Filler, Director of Managed Accounts at Conti Commodity Services, Inc., and a law professor, stresses that work in the compliance and legal departments of brokerage firms does require specific educational preparation. He says, "Although no special degrees are available, more courses in compliance and law have been added to law school curriculums to provide this education and to stimulate interest in the field." And in response to the needs of the law profession, the American Bar Association sponsored the first National Institute in Commodity Law Practice in 1979.

Besides these professional support positions, numerous other support personnel in the industry have an integral part in day-to-day operations. Clerical workers in brokerage firms include bookkeepers and cashiers in the operations department, wire and order clerks in the order department, commodity margin clerks in the accounting department, sales promotion clerks, and commodity sales assistants.

The exchanges themselves employ a number of persons in support positions, both professional and clerical. Some of these are full time, while some clerical positions are part time. To carry out their administrative duties, exchanges usually have specialized departments for audits and investigations, statistics and quotations, research, education, and public relations. Employees who staff these departments include accountants, investigators, economists, statisticians, commodity researchers, public relations workers, and education specialists.

Persons applying for economic research positions, according to recruiting material from the exchanges, are advised to have a master's degree in business administration with a specialty in finance or operations research, or a master's in economics or agricultural economics. For auditing positions, college graduates with business degrees and course work in accounting or with finance majors are sought. In data processing, graduates with computer science and operations research are recruited for computer programmer and computer analyst positions. Graduates with mass communication or journalism backgrounds are sought for public relations and education departments.

Education

As a result of increased interest and opportunities in the industry, over 62 universities and colleges now offer futures courses, according to the education office of the CFTC. This is nearly double the number of schools offering courses 3 years ago. According to Dennis Cameron, "I started in the business 15 years ago, and there was only one way to learn—through experience. Our economics textbooks had only one or two pages on futures markets. Now, at the Chicago Board of Trade, for example, they have their own education department which produces films, books, and pamphlets on the industry. And the number of formal college level courses available is astounding." Dr. Lloyd Besant, Education Director at Chicago Board of Trade, also notes this change. He says that universities are beginning to add courses in many different departments ranging from finance departments to economics departments in the agricultural schools and business schools. Whole books as well as sections of textbooks are being written on the market.

Business schools are adopting futures courses for a variety of reasons. At this time, schools consider the courses basic for all business executives rather than solely for students aspiring to work within the industry itself. Says Dr. Joel Rentzler, of the Center for Study of the Futures Market at Columbia University, "Managers increasingly will be called upon to know about the commodity futures market, and, primarily, a knowledge of hedging will be important as a managerial tool."

Law schools are also responding to the increased interest in the study of futures markets by adding pertinent courses. For example, the Chicago Kent College of Law of the Illinois Institute of Technology has established an annual Commodities Law Institute open to all lawyers, accountants, and CFTC registrants. Besides two specialized law courses on commodity futures, the college has started the *Commodity Law Journal,* published semiannually. For more information on these programs, write to

Assistant Dean David Helms
IIT—Chicago Kent College of Law
77 South Wacker Dr.
Chicago, Ill. 60606.

For a list of college and university courses, write to

CFTC
Education Office
2033 K St. NW.
Washington, D.C. 20581.

Correspondence courses have been useful in the past to prepare potential traders and brokers for participating in the industry. For information on available courses, individuals should write to one or more of the following:

N.Y. Institute of Finance
70 Pine St.
New York, N.Y. 10005.

Commodities Educational Institute
219 Parkade
Cedar Falls, Iowa 50613.

Futures Industry Association
1919 Pennsylvania Ave. NW
Suite 204
Washington, D.C. 20006.

The Futures Industry Association also offers an intensive, 2-day lecture course on commodity futures trading especially designed to prepare brokers for the NASD exam. Some brokerage firms use correspondence courses to train brokers.

Most exchanges have free pamphlets and publications on the industry and their exchange in particular, including information on career opportunities. Individuals may wish to write to one or more of the exchanges for this information.

Commodities Approved for Futures Trading

Barley
Belgian franc
British pound sterling
Butter
Canadian dollar
Cattle
Cattle, feeder
Cocoa
Coffee
Commercial paper
Copper
Corn
Cotton
Crude oil
Deutsch mark
Dutch guilder
Eggs
Flaxseed
French franc
Frozen boneless beef
Frozen orange concentrate
Frozen pork bellies
GNMA certificates
Gold
Grain sorghums
Heating oil
Hogs
Iced broilers
Imported lean beef
Industrial fuel oil
Italian lira
Japanese yen
Liquified propane
Lumber
Mexican peso
Oats
Palladium
Platinum
Plywood
Potatoes
Rye
Silver
Skinned hams
Soybean meal
Soybean oil
Soybeans
Stud lumber
Sugar
Swiss franc
U.S. silver coins
U.S. Treasury bills
U.S. Treasury bonds
U.S. Treasury notes
Turkeys
Wheat
Wheat, durum
Wool
Zinc

Chicago Mercantile Exchange

Futures Contracts Traded on Each Regulated Exchange[1]

Market	1970	1979
AMEX Commodities Exchange, Inc. (ACE)[2] 86 Trinity Place New York, New York 10006		64,319
Chicago Board of Trade (CBT) 141 West Jackson Boulevard Chicago, Illinois 60604	7,940,661	33,870,680
Chicago Mercantile Exchange (CME) and International Monetary Market (IMM) 444 West Jackson Boulevard Chicago, Illinois 60606	3,316,065	19,930,798
Coffee, Sugar & Cocoa Exchange (CSCE)[3,4] Four World Trade Center New York, New York 10048	666,614	2,510,179
Commodity Exchange, Inc. (CMX)[3] Four World Trade Center New York, New York 10048	872,430	12,952,353
Kansas City Board of Trade (KCBT) 4800 Main Street, Suite 274 Kansas City, Missouri 64112	179,954	1,037,018
Midamerica Commodity Exchange (MACE) 175 West Jackson Boulevard Chicago, Illinois 60604	55,660	2,568,950
Minneapolis Grain Exchange (MGE) 150 Grain Exchange Building Minneapolis, Minnesota 55415	49,744	328,799
New York Cotton Exchange & Associates (NYCE)[3] **Citrus Associates** **Petroleum Associates** **Wool Associates** Four World Trade Center New York, New York 10048	110,811	1,875,126
New York Mercantile Exchange (NYME)[3] Four World Trade Center New York, New York 10048	417,760	828,249
TOTAL, All Futures Contracts	**13,609,699**	**75,966,471**

[1] Figures supplied by Futures Industry Association.

[2] Approved August 22, 1978.

[3] One of four exchanges located at the Commodities Exchange Center (CEC).

[4] Formed by merger of the Coffee and Sugar Exchange and Cocoa Exchange.

U.S. DEPARTMENT OF LABOR
RAY MARSHALL, SECRETARY

Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The Occupational Outlook Quarterly is published four times per year, $6 domestic, $7.50 foreign, $1.75 single issue, by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Riverdale, Md. (USPS 492-690). POSTMASTER: Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SUBSCRIPTIONS AND SALES ARE MANAGED BY THE U.S. GOVERNMENT PRINTING OFFICE. Correspondence regarding subscriptions should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Prices are subject to change by the U.S. Government Printing Office.

EDITORS'S NOTE: Articles contributed by authors outside of the U.S. Department of Labor do not necessarily represent the views of the Department. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 523-1386.

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 30, 1984.

BUREAU OF LABOR STATISTICS REGIONAL OFFICES

Boston
1603 JFK Federal Bldg.
Boston, Mass. 02203
Phone: (617) 223-6727

New York
Suite 3400
1515 Broadway
New York, N.Y. 10036
Phone: (212) 944-3121

Philadelphia
P.O. Box 13309
Philadelphia, Pa. 19101
Phone: (215) 596-1154

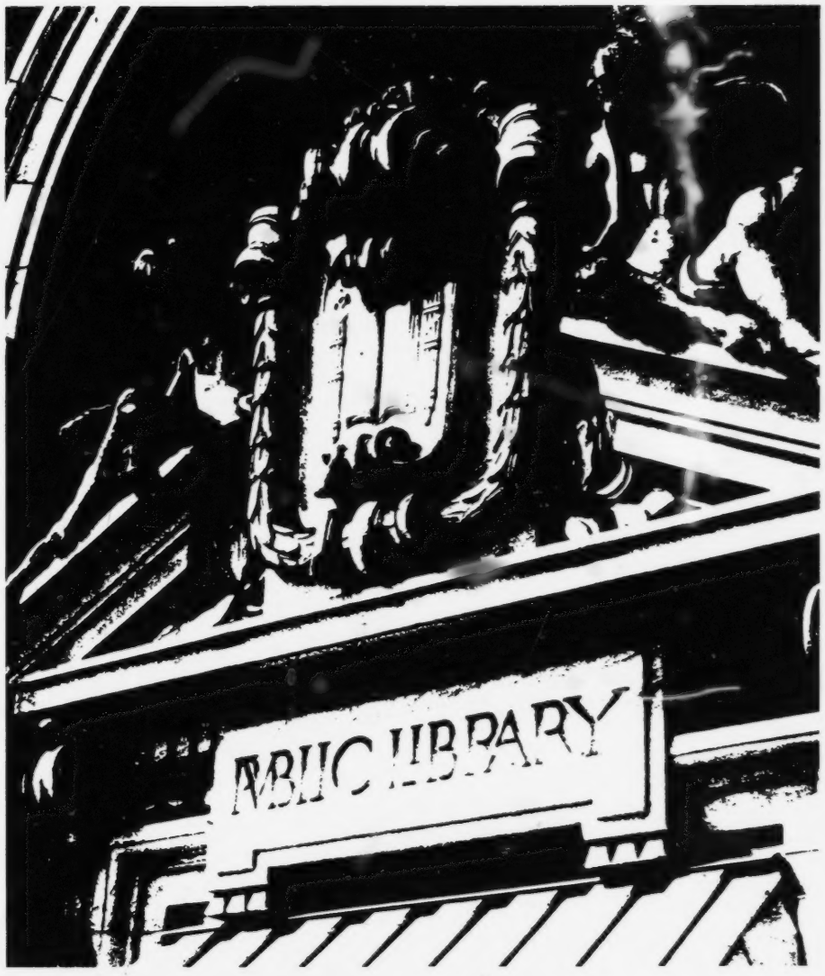
Atlanta
1371 Peachtree St. NE.
Atlanta, Ga. 30309
Phone: (404) 881-4418

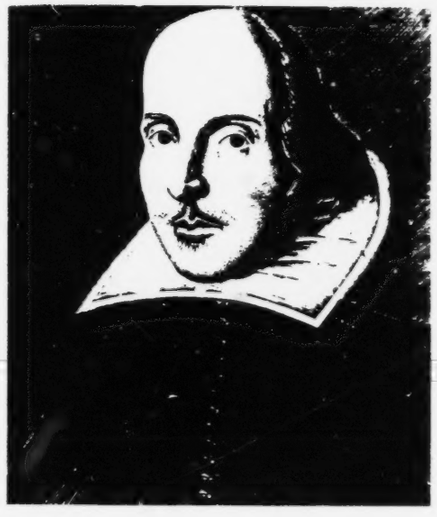
Chicago
9th Floor, Federal Office Bldg.
230 South Dearborn St.
Chicago, Ill. 60604
Phone: (312) 353-1880

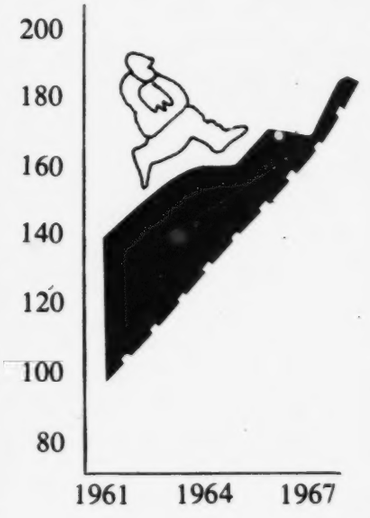
Dallas
2nd Floor, 555 Griffin Square Bldg.
Dallas, Tex. 75202
Phone: (214) 767-6971

Kansas City
911 Walnut St.
Kansas City, Mo. 64106
Phone (816) 374-2481

San Francisco
450 Golden Gate Ave., Box 36017
San Francisco, Calif. 94102
Phone: (415) 556-4678







Occupational Outlook Quarterly

Melvin C. Fountain, *editor*

Neale Baxter, *managing editor*

Gail M. Martin, *staff writer*

Kris Jorgensen, *art director*

Fall 1980 Volume 24, Number 3

Careers in Advertising — Douglas Braddock — **2**
The ad game has some big winners—and lots of losers who find that the rewards aren't worth the pressure and insecurity of the job. Here's a guide to the players.

The Job Hunter's Guide to the Library — Gail M. Martin — **6**
Speaking of ads, one on the bus reads, "You can find it at the library." How to land a job is one of the it's.

A Guide to Setting Up a Career Resource Center — Gail M. Martin — **12**
Of course, some people not only find out how to get a job at the library, they find a job there. If you did and you now want to know of some material that will help other people land jobs, this article's for you.

Writers and Editors: Or, Oh Ye Scribes and Scholiasts — Shirley Rudney — **18**
The challenges and rewards offered to that noble and superior group of highly intelligent workers who advance the cause of civilization by turning the barbarous productions of the tribe of scribbling hacks into glorious prose and poetry (and by composing pithy squibs such as this) are here described. Oh yes, writers are also discussed.

The Job Market for Teachers in the 1980's: — Lisa S. Dillich — **22**
Signs of Improvement
Higher for the lower and lower for the higher sums up prospects for teachers in the 1980's; or—putting it another way—compared to the 1970's, demand will be up for new teachers prepared to teach the elementary grades while demand will fall for new teachers prepared to teach in secondary schools, according to these new projections.
Charting the Course — **23**
These charts present some of the data that went into the new projections of the supply and demand for teachers.

Job Finding and Career Planning: A Course Outline — Todd Holder — **28**
Want some ideas on what to teach when the catalog calls for a course in "How To Get a Job"? Read this.

You're a What? Cruise Director — **32**
Do you think Noah had one?

Counseling Aids — **34**

Grab Bag — **36**

any of the following may be recommended: Standard and Poors' Register of Corporations, Directors and Executives, Who's Who in America, Who's Who in Commerce and Industry, Dun and Bradstreet's Million Dollar Directory, and Dun and Bradstreet's Middle Market Directory.

For general information, librarians may suggest *Career Guide to Professional Information: A Directory of Organizations by Occupational Field* (1976) or the *National Trade Associations of the U.S. and Canada and Labor Unions,* 1980. Other useful tools are the *Directory of Career Planning and Placement Offices* and the *College Placement Annual,* both published by the College Placement Council.

For information on Federal jobs and filling out applications, librarians may suggest the U.S. Office of Personnel Management's *Handbook X118* which gives detailed job descriptions for hundreds of government positions.

Some jobseekers want specific information on the local area and job market. Most public libraries have local directories. The reference librarian in one Fairfax County library made the following suggestions for patrons seeking information on local businesses:

- Industrial Directory of Virginia
- Industrial Directory of Fairfax County
- Principal Employers of the Washington Metro Area
- The Business Review of Washington.

Annual reports from companies are sometimes useful for jobseekers wanting information on current salary ranges in specific occupations. The *Occupational Outlook Handbook* also has salary information. The library may have the annual report published by the College Placement Council for college graduates on salary offers from various industries.

The reference section in most public libraries has telephone directories of cities throughout the United States. The yellow pages list and classify by product or service literally millions of employers, companies, and businesses which compilers of large directories frequently overlook. The yellow pages also list local business, trade, and professional associations. Other important listings include employment agencies, executive recruiters, and temporary help agencies. The white pages from cities around the country also list millions of potential employers, but patrons need to know the name of the employer. But in using the white pages, patrons have the advantage of seeing a breakdown of departments or divisions within an establishment—whether it's a company, university, or government agency. Job hunters may uncover departments that they were previously unaware of but that may be of assistance in finding a job.

The reference section within the library is of particular value to the mobile job hunter. Whether people actually receive a job offer or are interested in relocating, they need to assess the suitability of the new area. Factors which play an important part in deciding whether to move include the educational facilities, climate, housing, convenience of commuting, transportation services, recreation, and cost of living of the new area.

To assess these factors, the job hunter should locate both local and out-of-town directories and newspapers for areas of interest. The reference librarian can help in locating suitable directories and other reference materials. See the list at the end of this article for some suggested directories.

Most libraries have a special section for educational catalogs and reference materials. These include books on specific colleges and universities, financial aid, and special directories. Undergraduate and grad-

uate college catalogs from schools around the country are often arranged alphabetically in separate sections. Nearby are directories of secondary schools and community colleges. Peterson's Guides are popular reference items often located near other miscellaneous directories such as the *Secondary and Private School Directory, How to Prepare for College Entrance Exams,* and directories of correspondence courses and alternative ways to get college credit. Also included in this section of the library are guides to financial aid—a popular one being *Need a Lift? A Guide to Educational Opportunities, Careers, Loans, Scholarships and Employment,* by the American Legion.

One of the best career resource centers around may be the public library. Indeed, libraries today are as much for job hunters as book lovers. Through a little patient research, job hunters can obtain assistance and information on careers, getting a job, or employers. And very likely, if the library doesn't have the answer, the librarian will know where to get it. That's quite a service for any serious job hunter.

The following is a list of directories and reprints useful to the mobile job hunter, based on a bibliography done by James D. Lockwood, reference librarian at Indiana University.

American Automobile Association Tourguides provide a great deal of information regarding some communities. If these are unavailable, other travel guides may be of use.

Quality of Life Indicators in the United States Metropolitan Areas, 1970 (1975), compares 245 metropolitan areas with others of similar size along economic, political, environmental, health and education and variety of social dimensions. Similar studies of this nature are also published if the library does not have this particular one.

Uniform Crime Reports for the U.S. which is published annually by the Federal Bureau of Investigation (FBI), reports crime ratio (by type of crime) for certain cities with over 10,000 or more inhabitants.

Job Hunter's Guide to Eight American Cities, by Richard D. Salmon, gives details on the cities of Atlanta, Boston, Denver, Phoenix, Portland, San Diego, San Francisco and Seattle.

County Business Patterns, published by the Bureau of the Census of the United States Department of Commerce has information arranged by State, then county, on the number of employees and units in the following services: Agriculture, construction, manufacturing, transportation, retail trade, services, amusements, and more.

Statistical Abstract of the United States, U.S. Bureau of Census: Annual Summary of statistics related to social, political, and economic aspects of the United States.

Guide to the Health Care Field, published annually by the American Hospital Association, lists health care institutions in the United States by city or town, their accreditation or approvals, and selected services and facilities.

The National Atlas of the United States of America gives information on numerous subjects of interest to the mobile job hunter including economic factors, agriculture, minerals, manufacturers, business, concentrations of retail trade, transportation routes, communication facilities, railroad and air transportation, sociocultural factors, concentration of crime, religious and ethnic populations, educational institutions, administrative factors. Federal lands including National forests, parks, recreation areas, and military facilities.

Directory of Shopping Centers in U.S. and Canada, annual. Approximately 20,000 shopping centers listed by city.

Million Dollar Directory and *Middle Market Directory,* Dun & Bradstreet, N.Y., are published annually. The first features a supplemental geographical section (section II). They also contain lists of businesses according to net worth, and addresses, phone numbers, business type, annual sales, names of principals and number of employees.

Patterson's American Education published annually by Educational Directories, Inc., lists public and private educational institutions from elementary schools to universities by city or town for each state, including enrollment figures.

Russell's Official National Motor Coach Guide (Official Business Guide), published monthly by Russell's Guides, lists 450 intercity bus companies, along with timetables, schedules, and types of terminals or stations. Part 2, (in separate volume) provides addresses, hours, lines served, and additional information about each bus depot, station, or terminal.

Ayer's Directory of Publications, published annually, gives statistical and economic data by city and state: Population, income ranges, sales, housing, transportation, and banking. It covers 8,600 cities and towns—mostly in the United States.

University of Florida, Gainesville

ment manufacturers, business machine manufacturers, pharmaceutical companies, nuclear weapons manufacturers, law firms, and medical research centers. Among Federal agencies, employers include the Nuclear Regulatory Commission and the Departments of Energy and Defense.

A number of colleges and universities offer B.S. programs specifically in nuclear engineering. Students in these programs take courses common to all engineering students in mathematics, chemistry, and physics. They also take specialized engineering courses in solid mechanics, thermodynamics, heat transfer, the nature and property of materials, electrical phenomena, fluid mechanics, and mass transfer. Advanced courses include atomic and nuclear physics, advanced mathematics, and the design and utilization of nuclear systems. Nuclear engineers also study the interaction of radiation with matter, radiation measurements, radioisotope production and use, reactor physics and engineering, fusion reactors, and materials in the nuclear field.

Doctoral and master's degree programs in nuclear engineering are offered at many of the schools that offer B.S. programs. To apply for these advanced programs, students generallly need a B.S. in engineering, physics, chemistry, or mathematics. Students without one of these degrees may have to satisfy prerequisites before entering the program. For a list of schools write to

Education Office
Department of Energy
Washington, D.C. 20585.

For a copy of the brochure "Nuclear Engineering: A Challenge for a Promising Future," write to

Guidance Director
Department—Nuclear Accreditation Board for Engineering and Technology
345 East 47th Street
N.Y., N.Y. 10017.

Engineers are important to the solar energy industry, although a 1979 Department of Energy task force report on education and training in the solar energy industry suggested that generally there was no need for the development of a "solar engineer" curriculum. Rather, the report suggested engineers wishing to emphasize solar work be trained in a traditional engineering discipline and take some specialized courses in college or later. However, the report did state, "The most difficult to hire solar occupations include engineers, atmospheric scientists, operations systems designers, researchers, and college/university teachers."

It is estimated that 22,500 employees were engaged in solar energy work in 1978, both directly and indirectly. According to manpower projections done for the Department of Energy, a total work force of 21,900 is expected by 1981 in solar energy alone, and 6,200 will be engineers. The opportunities will largely depend on the Federal funding of research and development projects, since many engineers in the industry work in research and development. Approximately 40 percent of all workers in solar research and development are mechanical engineers. Generally, besides mechanical engineers, the field of solar energy will utilize electrical engineers, design engineers, environmental engineers, civil engineers, and architectural engineers.

Research and development fields include space heating and cooling, agricultural and industrial process heat, and photovoltaics. Besides these areas of research and development, solar engineers work in applications and analysis, design and installation, supervision, and computer analysis of heating and cooling by solar technology.

For a monthly newsletter on developments in the field of solar energy write to

Solar Engineering Publishers
8433 North Stemmons Freeway
Suite 880
Dallas, Texas 75247.

Other publications of interest they have are: *Engineer's Guide to Solar Energy, Solar Energy Source Book, Informal Directory of Organizations and People Involved in the Solar Heating of Buildings,* and the *Solar Energy Research Directory.*

For a solar bibliography of the U.S. Department of Energy/U.S. Department of Housing and Urban Development write to

National Solar Heating and Cooling Information Center
P.O. Box 1607
Rockville, Md. 20850.

Another bright field for engineers in energy is the area of energy management. According to a Baylor University study, at least 7,000 new jobs a year will open up in energy managment fields on the managerial and technical levels. According to the study, the top level energy managers would have engineering backgrounds in mechanical, industrial, civil, or electrical engineering—supplemented by experience or courses in energy conservation. But there is also room for professionals from other backgrounds since energy management can be geared toward areas such as policy and health.

Energy management is an interdisciplinary profession; the energy manager is basically a problem solver. Energy mana-

gers assess the economic, environmental, and social effects of energy resource distribution, production, conversion, or end use and attempt to control these variables.

Some very large companies have had energy managers for some time. Recently, as interest in energy conservation has increased, some of these positions have been upgraded and new companies have begun seeking persons with expertise in the field. Besides general industry, the main employers of energy managers include architectural, engineering, and consulting firms; State and local governments; and the Federal government.

Programs in energy management are available on the bachelor's, master's and doctoral levels in colleges and universities. These programs focus on five areas: technology, resources, environment and health, economics and policy, and politics and policy. Over 303 institutions offer one or more courses in some aspect of energy management.

About 10 schools offer master's degree programs in energy management and policy. The programs generally require that students have undergraduate degrees in engineering or science. Currently, one B.S. program is available at University of Illinois at Chicago Circle. It is a nonaccredited program.

The Association of Energy Engineers publishes a number of useful directories and books, as well as the *Journal of the Association of Energy Engineers.* The books and directories include: *The Directory of Energy Engineers Professionals, Energy Engineering Technology, Proceedings from the World Energy Engineering Congress,* and numerous other books on energy conservation techniques and practice. For a publications list, write to

The Association of Energy Engineers
4025 Pleasantdale Rd.
Suite 340
Atlanta, Georgia 30340.

Geothermal energy is just beginning to emerge and require engineers. Although some successful geothermal energy projects are underway and producing electric power, much of the field consists of exploration and experimentation. In many ways, the field is still in its embryonic stage.

Geothermal energy is produced from the natural heat of the earth captured in reservoirs thousands of feet below the earth's surface. Energy from these deposits can be harnessed by drilling wells into the production zones, as is done for oil and gas, and bringing the steam or hot water to the surface. The basic energy from geothermal sources powers turbogenerators which produce electricity for industry, agriculture, and homes. Most geothermal developments are located in the West since geothermal plants can only be built within geothermal fields.

There are four main areas of geothermal energy: direct heat applications (nonelectrical), electric power generation, reservoir engineering, and geothermal drilling. Direct heat applications range from mineral baths and fish farming to space heating.

The use of geothermal resources is usually complicated by their varied nature. As one industry professional stressed, each new operation becomes a unique research and development project. But the varied nature of resources also allows for multiple uses. Besides electric power generation and direct heat applications, they may be used for water production and desalination, natural gas recovery, or mineral recovery.

Geothermal energy has become a reality chiefly through the use of technology adopted from the petroleum industry. Consequently, engineering expertise needed in geothermal development has come chiefly from engineers trained in petroleum engineering programs.

At the present time, only a small number of goethermal engineers are employed in the field. They work for universities, laboratories, and the research departments of companies doing research and exploration. Sixty-seven "operators" are listed in the Geothermal Registry of the Geothermal Resource Council. These are primarily oil companies. According to company officials, the salaries of geothermal engineers are comparable to those of petroleum engineers.

Operations in the geothermal industry may be stepped up in future years as leases on Federal lands with geothermal deposits are expedited under the Geothermal Steam Act of 1970. According to a report of the Government Accounting Office, "How to Speed Development of Geothermal Energy on Federal Lands," the Federal government owns close to two-thirds of the Nation's total geothermal resources. There have been delays in leasing this land in the past for a variety of reasons, but pending legislation would offer financial incentives and other initiatives for leasing and geothermal development.

According to Jan Peacha, Supervisor of Industrial Relations for Union Oil Company of California, the engineers hired for the company's geothermal division's production department are engineering graduates with B.S. degrees in chemical and mechanical engineering or B.S. or M.S. graduates in petroleum engineering. Some of the areas in which they work are field and plant engineering, drilling technology, reservoir mechanics, production techniques, reserves and valuation, interpretation, and preparing reports for government regulations and permits.

Just as a solar industry task force on labor force needs recommended, a similar task force for the goethermal energy industry recommended no large scale specialized training of engineers for work in geothermal energy. According to a report done for the Department of Energy entitled, "National Geothermal Direct Heat Applications Manpower and Expenditure Requirements Through 1987," as the geothermal world expands its size, adequate numbers of personnel and resources should be available from the existing marketplace for geothermal energy development.

At least 4 schools offer degree programs in geothermal engineering. Geothermal courses are normally part of the petroleum engineering department, materials or mineral science department or geological engineering, depending on where the geothermal engineering faculty is located.

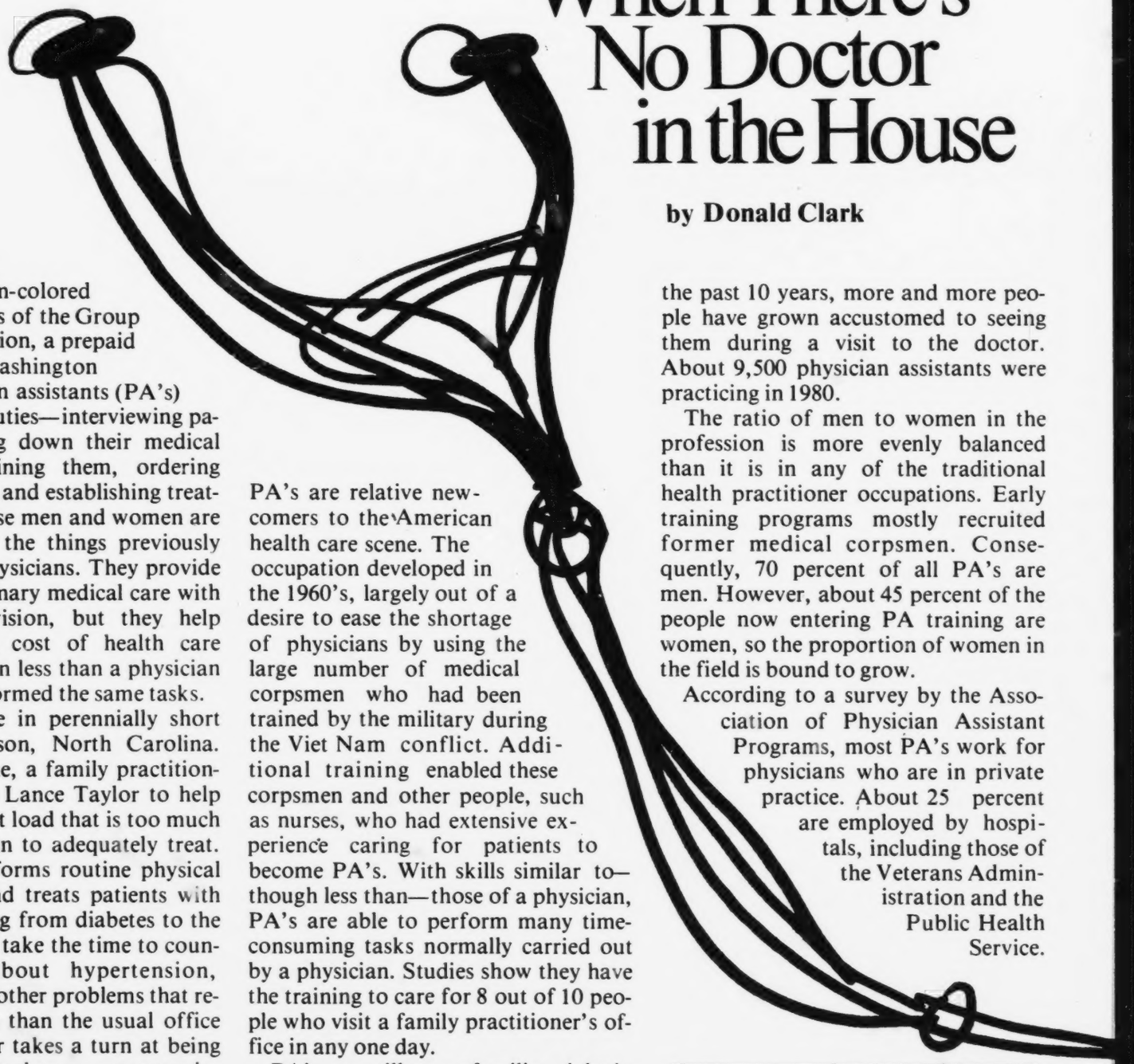
For more information on geothermal energy, write for "Geothermal Energy: Harnessing the Natural Heat of the Earth," from

Union Oil of California
Corporate Communications Department
Box 7600
Los Angeles, Calif. 90051.

PHYSICIAN ASSISTANTS:

When There's No Doctor in the House

by Donald Clark



In the cream-colored examining rooms of the Group Health Association, a prepaid health plan in Washington DC, 10 physician assistants (PA's) go about their duties—interviewing patients and taking down their medical histories, examining them, ordering laboratory tests, and establishing treatment plans. These men and women are doing many of the things previously done only by physicians. They provide high quality primary medical care with physician-supervision, but they help curb the rising cost of health care because they earn less than a physician would who performed the same tasks.

Physicians are in perennially short supply in Jackson, North Carolina. Dr. Susan Levine, a family practitioner, employs PA Lance Taylor to help care for a patient load that is too much for one physician to adequately treat. Mr. Taylor performs routine physical examinations and treats patients with problems ranging from diabetes to the flu. He can also take the time to counsel patients about hypertension, depression, and other problems that require more time than the usual office visit. Mr. Taylor takes a turn at being on-call for afterhours emergencies too, giving Dr. Levine additional free time for study or leisure.

PA's are relative newcomers to the American health care scene. The occupation developed in the 1960's, largely out of a desire to ease the shortage of physicians by using the large number of medical corpsmen who had been trained by the military during the Viet Nam conflict. Additional training enabled these corpsmen and other people, such as nurses, who had extensive experience caring for patients to become PA's. With skills similar to—though less than—those of a physician, PA's are able to perform many time-consuming tasks normally carried out by a physician. Studies show they have the training to care for 8 out of 10 people who visit a family practitioner's office in any one day.

PA's are still an unfamiliar sight in many places, and they sometimes take patients by surprise. Nonetheless, over the past 10 years, more and more people have grown accustomed to seeing them during a visit to the doctor. About 9,500 physician assistants were practicing in 1980.

The ratio of men to women in the profession is more evenly balanced than it is in any of the traditional health practitioner occupations. Early training programs mostly recruited former medical corpsmen. Consequently, 70 percent of all PA's are men. However, about 45 percent of the people now entering PA training are women, so the proportion of women in the field is bound to grow.

According to a survey by the Association of Physician Assistant Programs, most PA's work for physicians who are in private practice. About 25 percent are employed by hospitals, including those of the Veterans Administration and the Public Health Service.

Donald Clark is a labor economist in the Division of Occupational Outlook, Bureau of Labor Statistics.

A small but growing number of PA's work for prepaid health plans or clinics. Whether employed by a physician, a hospital, a clinic, or a health plan, PA's are under the direction of a supervising physician.

Despite efforts to encourage physicians to practice where they are needed most, many rural areas and inner cities remain underserved. Particularly in these areas, PA's provide crucial health care services. Almost 20 percent of all Americans live in counties with a population less than 50,000, yet only 8 percent of all active physicians are located in these areas. On the other hand, more than 40 percent of all PA's practice in them.

Although most PA's in "medically underserved" areas are associated with physicians in private practice—like North Carolina's Dr. Levine—some work in clinics. A physician might be available just 1 or 2 days each week in these clinics. For the balance of the week, a PA working with one or more nurses, technicians, or medical assistants, provide all health care services. PA's in these settings usually have quick telephone access to a physician for consultation, but experience has shown that few consultations are normally needed. The Rural Health Clinics Service Act of 1977 helped promote this type of practice by making reimbursement by Medicare easier, and currently over 10 percent of all PA's practice in one of these clinics.

Training

In early 1980, 62 educational programs for primary care physician assistants or surgeon assistants—a related occupation—were approved by the Committee on Allied Health Education and Accreditation of the American Medical Association.

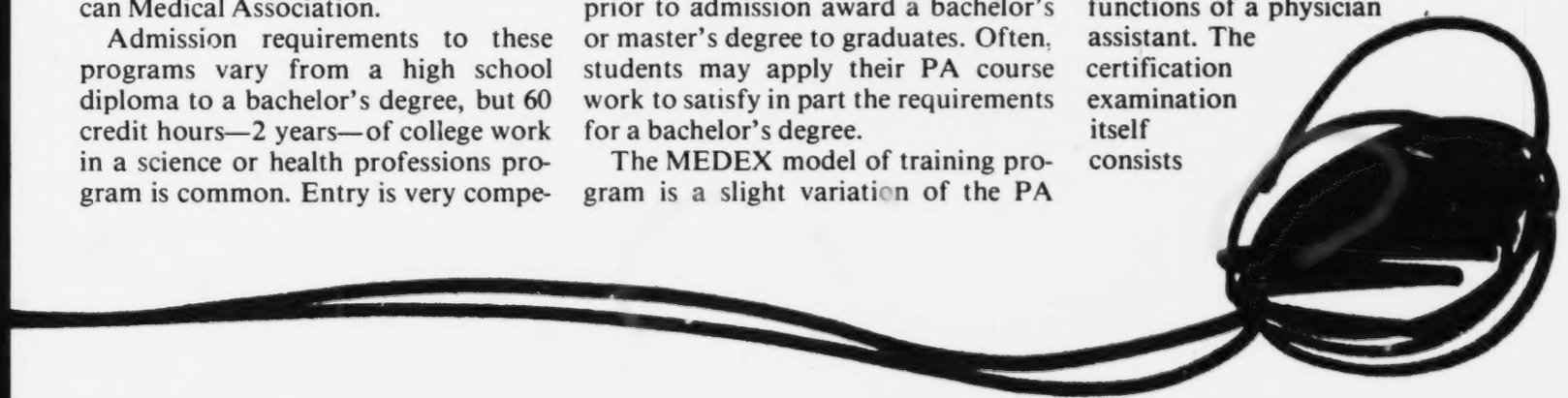
Admission requirements to these programs vary from a high school diploma to a bachelor's degree, but 60 credit hours—2 years—of college work in a science or health professions program is common. Entry is very competitive; many applicants already hold a bachelor's or master's degree. Currently, 80 percent of the students now in PA programs had extensive experience in health care before they started their studies. Many programs consider such experience, in jobs ranging from medical technician to nursing aide, an important requirement for admission. Still, lack of experience need not be a barrier to applicants who are otherwise qualifed.

Training programs are generally 2 years in length, although some are longer and a few that require prior health-related training are shorter. These programs are located in medical schools and in community colleges, 4-year colleges, and universities affiliated with accredited teaching hospitals. PA training begins with a classroom or preclinical phase that lasts 9 to 12 months. Classroom instruction includes anatomy, physiology, chemistry, biochemistry, medical terminology, human behavior, pharmacology, clinical medicine, radiology, microbiology, and pathology. Students then spend about a year doing clinical work in a series of clinical "rotations." Some of the rotations—or medical specialties—studied include family practice, in-patient medicine, general surgery, obstetrics and gynecology, emergency medicine, internal medicine, psychiatry, and pediatrics. Often, one or more of the rotations are served under the "preceptorship" or supervision of a physician who is seeking to hire a PA. This "trial" employment often leads to a permanent position.

Most PA programs award graduates a certificate attesting to their training. Some programs award an associate of arts degree, however, and the 20 or so that require extensive college work prior to admission award a bachelor's or master's degree to graduates. Often, students may apply their PA course work to satisfy in part the requirements for a bachelor's degree.

The MEDEX model of training program is a slight variation of the PA program. MEDEX trainees must have extensive direct patient care experience, usually in roles such as medical corpsman or registered nurse. This extensive background allows for a shorter period of classroom training and increased emphasis on clinical experience. MEDEX students usually gain most of this clinical experience working with the supervising physician (SP) who will hire them upon graduation. MEDEX programs are slightly shorter than other PA programs, lasting about 18 months.

The activities of PA's are regulated in nearly every State, but the requirements of these laws vary widely. Some States require that PA's be formally trained or certified by the National Commission on Certification of Physician Assistants, Inc. (NCCPA). Most States also require PA's to register with the State medical board or a similar agency. Because there is so much variation, however, aspiring PA's should review the laws in those States where they wish to practice. Thirty-five States require PA's to be certified. In 1980, about 8,000 or 85 percent of them were. Applicants may qualify to take the certification examination in one of three ways. By far the most common way is to graduate from an approved PA training program. The second way, available only to registered nurses, is to complete an approved program to train pediatric or family nurse practitioners. Third, applicants may qualify if they have a high school diploma (or have a general equivalency certificate) and have worked full-time for the past 4 years in a medical clinical setting as a physician assistant or nurse-practitioner and their employer can verify to the NCCPA that the work experience included all of the essential health care functions of a physician assistant. The certification examination itself consists



YOU'RE A WHAT?

COMMODITY BROKER

Chicago Mercantile Exchange

The *Los Angeles Times* on February 21, 1979, reported in bold headlines, "Heavy Snow Puts Chill on Life in Washington." The article, which told of the biggest snowstorm to hit the Nation's capital in 50 years, began with an anecdote about Mike Blum, stockbroker, who headed for work while most of Washington remained inert. Along with his briefcase, he carried a snowshovel under his arm.

Mike Blum is not just a stockbroker; he is also a commodity futures broker. There is a certain magnetism that draws Mike and his fellow professionals daily to the hectic world of commodity futures contracts trading. To find out why not even a major snowstorm could chill Mike's enthusiasm for his job, we interviewed him and coworker Sam McClure, account executives for the brokerage firm E. F. Hutton & Co., Inc.

OOQ: What is a commodity futures contract?

Blum: A futures contract is a standardized, transferable agreement to buy or sell a specific amount and type of commodity for delivery at a future date and at a price established at the time of trade. The contract delivery date may be as far into the future as 30 months away. Contracts are traded in over 58 different commodities ranging from cotton to plywood.

Each exchange specifies both the size of the contract and the quality and type, delivery point, delivery terms, and delivery dates of the commodity in question. The only thing negotiable is the price, which is settled on the trading floor.

OOQ: What's a typical contract?

Blum: There is no typical contract. A futures contract may be traded with a delivery date as far into the future as 1 year or more. So, one trades July 1980 corn or January 1981 wheat and so on. A contract is created as soon as there is a buyer and seller. Each party is required to put up "earnest money," also called "margin money," which is usually 5 to 10 percent of the total value of the contract.

OOQ: What are the actual steps in trading a contract?

Blum: I write the order up; it is wired directly to the appropriate exchange in Chicago, New York, Kansas City or wherever it's located; and then the operator sends it down to the floor for the floor broker to place. The broker bargains on the floor to get the best deal. Many other brokers may be there trying to do the same thing. Actually, it's like a giant auction with the noise so loud that brokers use both hand signals and verbal bids. After the floor broker makes a deal, the wire operator calls me back to say what the price for the contract was, and I call the customer. The whole process may take only 2 or 3 minutes.

OOQ: What's it like to be a commodity broker?

Blum: Actually, it's like a great juggling act. I monitor price changes on the computer terminal here and advise clients of price changes as they happen. At some firms, brokers handle either stocks or commodities but not both. At this firm, two associates and I trade in both areas. I spend my day giving advice on market trends, compiling facts from research on all the variables involved for different commodities, doing numerous administrative tasks for my accounts, watching market developments on all the exchanges, and, of course, taking orders for contracts, which I send to the floor broker.

OOQ: How long did it take you to really learn the ropes of commodity brokering?

Blum: After the initial training for background and rules, it takes about 2 years on the job to really understand the fundamentals and learn what to watch. It also takes time to develop a clientele that trusts you. Only then does a commodity broker establish a practice.

OOQ: How do you formulate good advice for your clients?

Blum: I begin by being in the office by 7:00 or 7:30 every day to do the voluminous paperwork required. Commodity brokers cannot be passive fig-

ures who sit around and take orders. We must read voraciously and constantly check the many variables associated with different commodities. We have our own in-house weather service, for example, which provides current reports on worldwide weather conditions and forecasts. Also, we have a commodity charting service which provides charts of prices over time for each commodity. They tell what prices have been and what they are now.

OOQ: How do you deal with the most obvious disadvantage of your profession: Stress?

Blum: It is a tough business and the tension can be extremely high. If you make a mistake—place an incorrect order or give bad advice—that same day you will find out that you blew it. And there are usually no small errors—only big and bigger ones.

It helps that I make sure my customers are fully qualified before trading—that they have the financial resources, strong nerves, and persistence needed to be in this market. I probably chase some customers away, which is fine, since they must fully understand what risks they are assuming. They must realize that their $5,000 margin deposit on a soybean futures contract—and even more—can be lost. I tell them if they can't handle that thought, then they can't handle the reality of the market. I am not an altruist, but I want to know that I have done my job and provided a useful service. I not only place orders to get commissions, but also offer a full range of advisory services to clients.

OOQ: Besides nerves of steel, what else might be important for a commodity broker?

Blum: A broker has to be meticulous, since mistakes in this business are always big errors with lots of money involved—more than I might earn in a month. Also, a broker must differentiate between important and nonessential factors and should be able to do three or four things at once without becoming flustered. Finally, the broker should understand economics and have eclectic reading habits and interests, since factors affecting commodity prices bridge many areas.

McClure: Definitely you need to get along with people and communicate clearly. Also, a broker needs an understanding of the economic basis of the market and, to some extent, mathematical abilities. A potential broker should show great stability. Commodity futures can be volatile—some more than others—and clients can stand to gain large amounts or lose great sums. Brokers need to maintain a level head since the market moves up and down quickly. In fact, the Commodities Futures Trading Commission recognizes this volatility and places both minimum and maximum daily price fluctuations on each commodity.

OOQ: How did you get into the field?

Blum: I graduated with honors in journalism from the University of Maryland only to find that the best job I could get was as a reporter on a small town newspaper. It offered me $65 a week, a bicycle, and all the hours I wanted to work. Instead, I joined the Army and, during my enlistment, got interested in the stock market. I began selling mutual funds part time, took a few business courses, and learned largely through the school of hard knocks. After leaving the military, I traded stocks and bonds for 7 years before entering a training program to become qualified to trade commodity futures contracts. I've been doing both for 7 years now.

McClure: My background is in finance. I have an M.B.A. from the University of Pennsylvania's Wharton School. I began by trading stocks and got interested in gold when I noticed that prices seemed to be up on items that could be "stored away." The company ascertained that I had the potential so they trained me to trade commodity futures contracts. I've been in the field for about 3 years; before that I was in the military, and my undergraduate degree is in electrical engineering.

OOQ: How does a prospective commodities contract broker go about preparing for, or entering, the field?

Blum: In my opinion, sales experience and life experiences are crucial factors. This is not a job for a person fresh out of college. A college education may be important, but not a necessity. A sharp farmer with an understanding of the futures market and variables may make an excellent broker, even without an agricultural degree from a university. I think that brokerage houses prefer people who are seasoned in the business world and who will be committed to the career after they've been trained, since the training does cost the company money. A career in sales is good preparation.

McClure: I would suggest a college degree with as many courses in related subjects as possible—financial instruments, agricultural economics, or commodities law.

OOQ: What are the earnings like?

McClure: A starting broker may earn $25,000 to $30,000 per year and in a small city, perhaps $15,000 to $20,000. After 5 years, I'd say $50,000 per year is a safe estimate.

Blum: You earn what you produce, basically. For each transaction, the broker gets a commission; in commodities, it's about $55 per transaction. But, unlike a stock broker, the commodity broker doesn't get a commission each time a transaction takes place but each time a contract is "offset"; that is, each time a trader takes the opposite side of the market—a trader buys back a contract he or she initially sold, or vice versa. In the commodity futures industry commissions are called "roundturn."

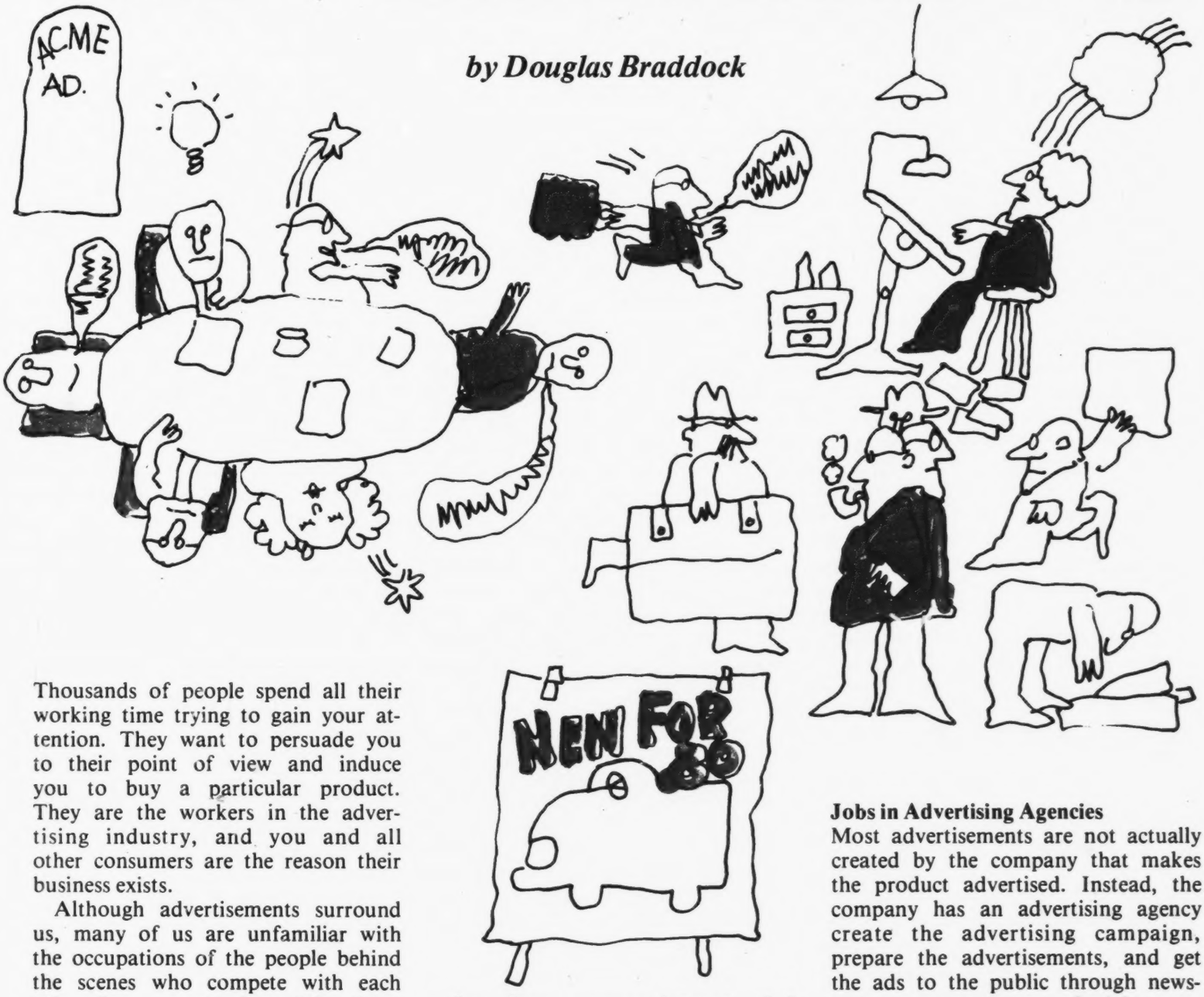
OOQ: You apparently like your job very much, but do you ever wish for a less hectic occupation?

Blum: There are times when I get tired, but not for long. I love the job and find it stimulating. Every day is different. It's an occupation where you have to be plugged in to be good. Once you are, the current flows and electricity sparks. In my opinion, not many jobs offer that attraction.

Gail M. Martin, an OOQ staffwriter, interviewed Mike Blum and Sam McClure. "Careers in Commodity Futures Trading," elsewhere in this issue, tells more about this industry.

CAREERS IN ADVERTISING

by Douglas Braddock



Thousands of people spend all their working time trying to gain your attention. They want to persuade you to their point of view and induce you to buy a particular product. They are the workers in the advertising industry, and you and all other consumers are the reason their business exists.

Although advertisements surround us, many of us are unfamiliar with the occupations of the people behind the scenes who compete with each other for our attention. Advertising offers a variety of careers that involve above average interest, challenge, and rewards. Advertising careers also often involve considerable job insecurity and pressures to perform.

Douglas Braddock is a labor economist in the Division of Occupational Outlook, BLS.

Jobs in Advertising Agencies

Most advertisements are not actually created by the company that makes the product advertised. Instead, the company has an advertising agency create the advertising campaign, prepare the advertisements, and get the ads to the public through newspapers, magazines, television, or other media. The agency is usually paid a commission based on the cost of publishing or broadcasting the ads. Agencies produce almost all na-

tional advertising for newspapers, magazines, radio, and TV. Only advertisements for large, local retail stores, such as department stores, are generally produced by the advertisers themselves.

In 1979, about 150,000 people worked in advertising agencies. In addition to the many people employed in clerical, financial, and managerial jobs that are similar to those in other industries, a number of workers have occupations that are found only in advertising.

Every agency has one or more *account executives,* the people in charge of the agency's accounts. An account is all the advertising done for each individual advertiser or client. Because the account executives coordinate all the activities involved in producing a client's advertising, they must have good management skills. They also determine the nature of the advertising campaign, so they must have a keen sense of what will be effective and, since they represent the agency to the client, they must be able to convince the client that the agency's work is successful. The account executive's job obviously is not for beginners; this is the position to which ambitious advertising workers aspire.

Copywriters write the text, or copy, of advertisements. They must have an excellent command of English and be able to write persuasively. Most copywriters start off in some other advertising job, then move to copywriting when they demonstrate the necessary skills in writing.

Art directors are responsible for the way the ad looks. In the advertising world, art refers to everything but the words of the copy, including the type style, photographs, illustrations, and the arrangement of all these elements on the page. Art directors often supervise others who actually lay out the ad, draw illustrations, and take photographs.

Some agencies employ *commercial* or *graphic artists* to draw company trademarks, illustrations, and other parts of the advertisement that can't be produced with photographs or readily available type faces. It is common, however, for much of this work to be handled by freelance commercial artists. A freelance artist is self-employed and may work for many different agencies or companies. Agencies also employ *layout people,* who set up printed advertisements for reproduction. They may select the size and type of print to be used in an ad and arrange the photograph and text for the best effect. In addition, agencies also sometimes employ *photographers,* although, as with commercial artists, a freelance photographer is often engaged for each individual project.

Media directors or *media buyers* and their assistants buy space or time for advertisements in the appropriate media. Media directors must not only know the most appropriate media for each advertisement but they must also know which publication, TV or radio station, or billboard location would be most effective. Beginners often start in the media department.

Production managers and their assistants arrange to have the ad printed, filmed, or recorded. They often deal with other firms or freelance workers who do much of this work. This work is especially demanding in the case of producing TV advertisements, because of the high costs and exacting standards involved in producing even the simplest commercials.

Although not restricted to advertising agencies, marketing research is instrumental to the creation of effective advertising. *Marketing research workers* provide important information on the characteristics of potential buyers—their shopping habits and their preferences—and on the effectiveness of the advertising campaign. This flow of information helps the account executive implement and modify the ad campaign.

As you can see, preparing an advertisement takes teamwork. Under the direction and coordination of the account executive, copywriters write the text, the art director determines the apearance, the media director buys space for it to be printed or time for it to be broadcast, and the production manager arranges to have it recorded or printed. On larger accounts, all of these people may be permanently assigned to work on one product. Some large accounts, such as one for an automobile or a heavily advertised household product, may involve a team of hundreds constantly preparing all sorts of ads. On the other hand, account executives, copywriters, and others in the agency may work on several smaller accounts.

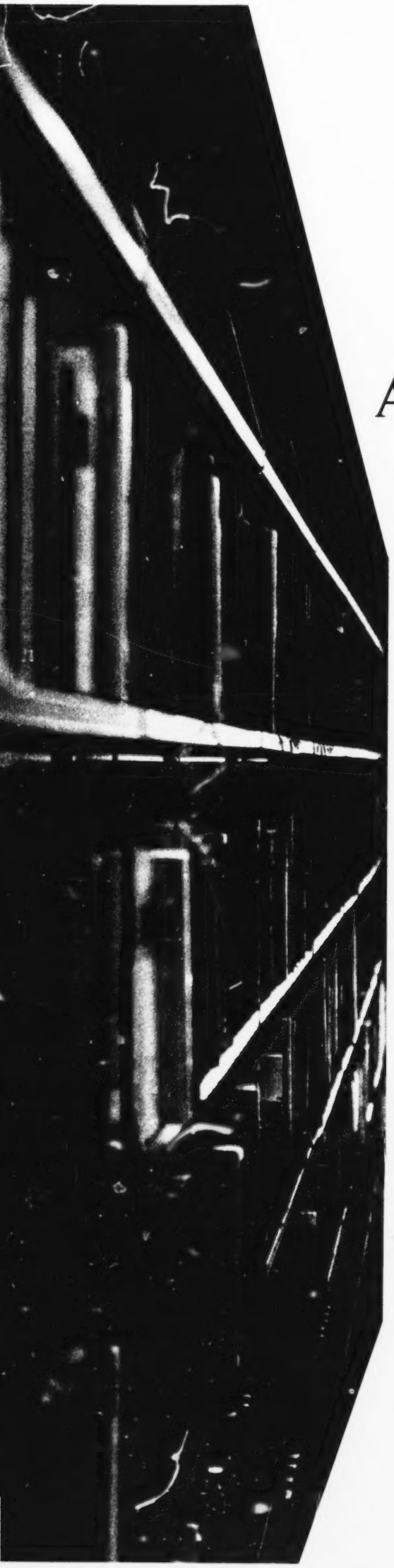
Nonagency Jobs

Although advertising agencies are the most visible employers of advertising workers, at least as many advertising workers probably are employed elsewhere.

Most companies have a marketing department in charge of selling the company's products. This department may have responsibility for research into new products, package design, the sales force, direct mail campaigns, and other promotional efforts including advertising.

An *advertising manager* in the marketing department, usually with the help of a support staff, decides how much to spend on advertising and what advertising agency to use. Often, when a new advertising campaign is called for, a company will ask several agencies to present ideas for the campaign and often will even ask for sample advertisements. Advertising managers then choose the agency they feel will do the job most effectively. Once the agency is selected, there still must be a considerable amount of supervision and communication between the company and the agency as the important details of the campaign develop.

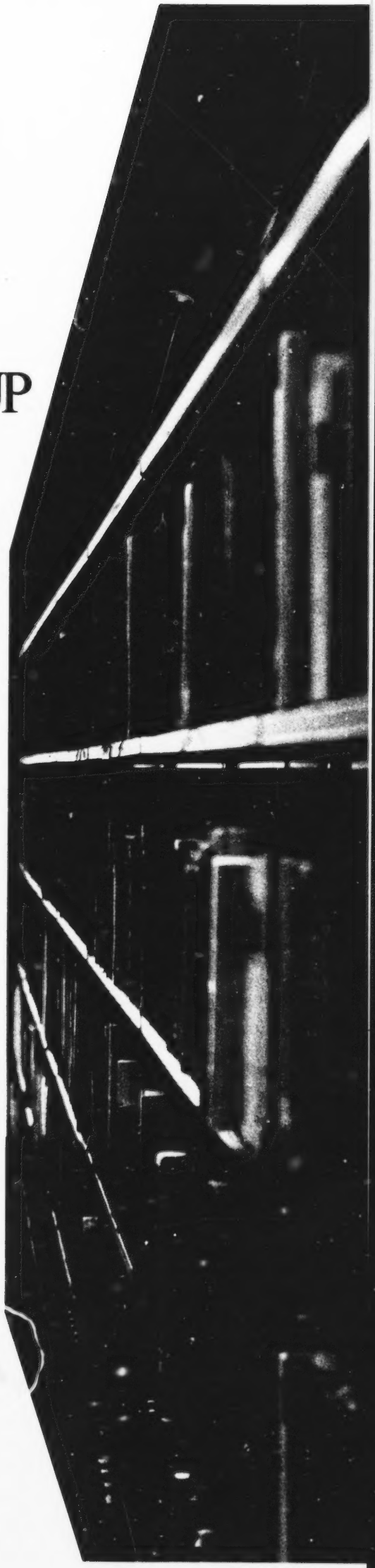
Some companies, especially large retail firms, produce their own advertising, as was mentioned above. They employ copywriters, art directors, layout people, media directors, and others who perform much the same functions as those in advertising agencies. Some in-house advertising departments can be very busy places indeed. Many department stores and other large retailers pre-



A GUIDE TO SETTING UP

A CAREER RESOURCE INFORMATION CENTER

by Gail M. Martin



More and more librarians today are coming to realize that answering patron's questions on careers and job hunting tactics is as important as answering a research question in any other field. Certainly the number of persons who are turning to their public libraries for this information has grown. According to a report, "Forty Millions Americans in Transition," by the College Entrance Examination Board, the Majority of those surveyed preferred information on careers, especially lists of available jobs and facts about career fields, to guidance, counseling or training.

Any librarian can start a career information center by simply pulling together in one place all of the library's material on jobs and careers. Resources scattered throughout the library may be accessible to experienced users, but the average patron can use all the help that's available to locate them.

The librarian must tailor the service, however elaborate or small, to the local community. For some areas, a more fully staffed center, if finances allow, would prove best. Another consideration for the librarian is the location of this service within the library.

Acquisition

The first step in acquisition is the evaluation of existing materials. Since career fields, salary figures, and opportunities within each field are always changing, books and material already in the collection should be carefully examined, and outdated materials weeded out. Yet the librarian should keep in mind that what may be outdated in details of salary or outlook may give a good history of an occupation.[1]

Acquisition of new materials is a challenging task. According to Nancy Woodhall of Virginia's Fairfax County Library System, "It's not all that easy to find good career materials." Although Fairfax County has a centralized purchasing system, the staff of smaller public libraries not part of a system may have an even more difficult time locating and deciding on what to buy with limited funds. For some help, directories and bibliographies with many suggestions for starting a career center are listed at the end of this article.

As far as possible, librarians should take their cues about what to order from patrons. The most frequent request at one library was for help in composing resumes, so materials were purchased to answer questions on this topic. By thinking about what areas are of most interest, a librarian can ensure that what is acquired will be used. The librarian should consider whether a significant proportion of the clientele represents any particular group and look for information geared toward these groups, such as women, disadvantaged, or minorities.

Answers to the following questions may help in evaluating directories, books, pamphlets, films, and other data for the library collection:

- Does it present material objectively, or can a bias be detected?
- Does it describe the important abilities and personality traits necessary for the occupation in question?
- Does it tell of the drawbacks as well as the good points?
- Does it give realistic salary information—not just the higher ranges?
- Does it tell what training is necessary and what entry level positions are like?
- Does it mention the proportion of women and minorities in the occupation?

Once the search for materials begins, the usefulness of free materials should not be overlooked. Some states provide free career briefs. California, for instance, has over 400 free guides in its series. Other States that have career guides are

Alabama	California	Indiana
Arizona	Colorado	Idaho
Illinois	New Jersey	Pennsylvania
Michigan	Ohio	Utah
Mississippi	Oregon	Washington

Many professional associations and trade and business groups offer free or inexpensive career materials. Directories such as the *Encylopedia of Associations, A Career Guide to Professional Associations: A Directory of Organizations by Professional Field,* and *National Directory of Trade, Professional Associations and Labor Unions in the U.S. and Canada,* may be helpful in drawing up a list.

In contacting these organizations, much staff time can be saved by using standardized, preprinted postcards. The following example, or something similar, may be effective for soliciting free materials:

> Dear Sir/Madam:
> Please send us a free copy of your publication _____.
> Also, please put us on your free mailing list, if you have one.
> Thank you,
> Your name, title
> Name of library
> Full address

In reviewing free materials, watch for objective and accurate information. The sponsoring organization may have a particular point of view which influences the inclusion or omission of information.

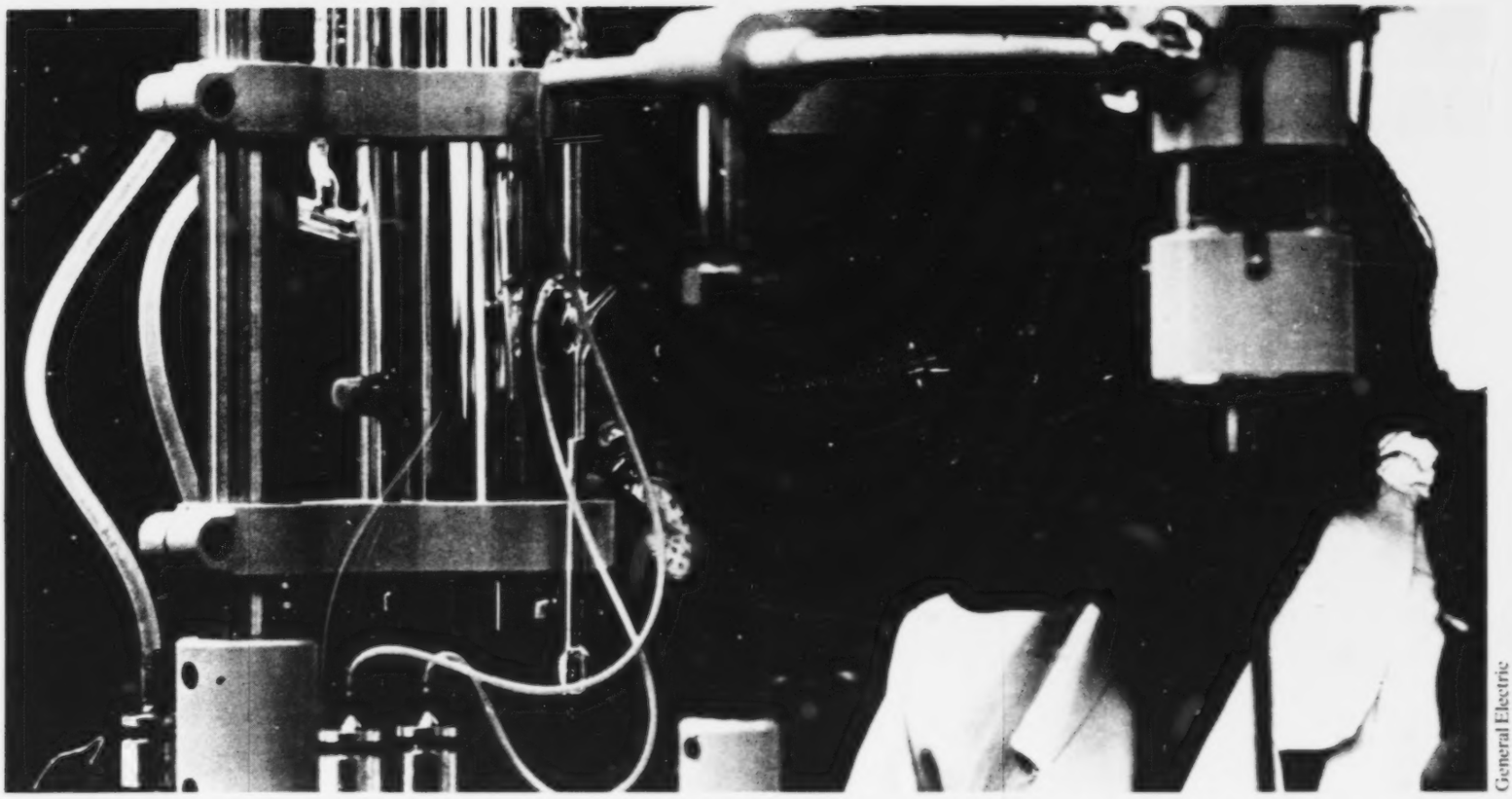
Choosing commercial directories, books, pamphlets, and guidelines may be a more difficult and selective process. It's wise to request an examination copy or sample copy. A short, neatly written letter on official library stationary can aid with the appeal. This is particularly important when purchasing a series that's cost may represent a large percentage of the funds budgeted for career information. If the publisher will not send samples from the series, a neighboring library might lend some.

The librarian should consider ordering duplicate or multiple copies of certain well-known career books. For example, most libraries have more than one copy of the *Occupational Outlook Handbook*—one for behind the reference desk and the other for wider circulation. Because of the strong demand,

---

[1] For a good discussion of evaluating career literature, see Robert Hoppock, *Occupational Information: Where To Get It and How To Use It in Career Education, Career Counseling and Career Development,* (McGraw Hill Book Company, 4th edition, 1976) Chapter 5, "Appraising Occupational Literature," pp.41-50.

Gail M. Martin is an OOQ staffwriter.



General Electric

Ceramic Engineering

In the last 30 years, dramatic advances have occurred in ceramic engineering. Coupled with new demands from the computer, solar energy, and nuclear industries, the ceramic industry is growing. BLS estimates about 550 ceramic engineers will be needed each year until 1990. According to Dr. Arthur Friedberg, Director of the Society of Ceramic Engineers, this need is underestimated. He says, "I would say the demand for ceramic engineers is even greater than this—550 is perhaps the minimum. Industry just can't get enough of them. Chemical engineers, geologists, and chemists are recruited for these jobs."

Only 13 schools in the United States offer accredited programs in ceramic engineering on the B.S., M.S., and Ph.D. levels. Together, they do not graduate enough students to fill yearly demands. The number of engineering students choosing ceramic engineering is increasing slowly on the master's level but is actually declining on the bachelor's and doctoral levels. From a high of 229 bachelor degrees awarded in 1969, the number declined to 156 in 1978. Ph.D.'s numbered 26 in 1969 but only 17 in 1978. The number of ceramic engineers graduating with master degrees has gone from 33 in 1969 to 43 in 1978.

The ceramic engineer is a materials science specialist, since ceramic engineering involves the study of materials, their behavior, application, and use. Ceramic engineers work in basic research, new product development, technical sales, production, and management.

No materials are perfectly suited for all situations and applications. The ceramic engineer must determine which material is best for the specific application or product. Some traditional materials produced by ceramic engineering include cements, plastics, brick and tile, glasses, and porcelain enamels. Companies in the ceramic industry have over 7500 products. Developments in physics and chemistry of the solid state, the application of heat process, and basic studies in the last decades have all contributed new and sophisticated products such as computer memory cores, miniaturized circuits, aircraft components, structural parts for nuclear reactors, human bone and teeth replacements, catalytic convertor components, and high speed machining tools.

The demand for new products has spawned the development of new specialities in ceramic engineering. Bioceramic engineers work with medical scientists to develop electronic components and materials used as body sensors and monitors. With the development of ceramic materials which have chemical and biological tolerance of the human body, many medical devices have become possible. Ceramic engineers who specialize in electrical ceramic materials are called dielectricel engineers. They are concerned with production of thermal, nuclear, and electrical current containments for power generation.

Fractography is a specialty within ceramic engineering which analyzes breaks and cracks in materials. Another specialty, fiber optics, is concerned with the development of silica glass fibers. Firing studies specialists, another subgroup, try to reduce energy consumption needed in producing ceramics.

According to Dr. Friedberg, starting salaries for ceramic engineers with a B.S. averaged $19,000 to $20,000 per year in 1979. For more information on careers, write for "Career Opportunities in Ceramic Engineering" from

American Ceramic Society
65 Ceramic Drive
Columbus, Ohio 43214.

Plastics Engineering

Plastics engineering has emerged largely due to the great demand for products made from plastics and diminishing supplies of other materials, such as wood, metal, and ceramics. Plastics are currently in great demand in the building and construction trades, the electrical and electronics field, and the food, clothing, and packaging industries.

Plastics engineering deals with taking apart raw materials—coal tar, coal, petroleum, wood, natural gas, and salt—and rearranging their molecules to make synthetic materials. Plastics are the basis of the polymer industry which includes synthetic fibers, elastomers, coatings, and adhesives. Basically, a polymer is a compound composed of small repeating units, *mers*, which are joined together to form chains of great lengths. Nylon, polyethylene, and polystyrene were the first materials made from polymers in the 1930's and 1940's.

Today, a plastics engineer may go into pure research, design, development, technical service, marketing, consulting, or teaching. Employers include raw materials suppliers, plastics machinery manufacturers, plastic compounders and converters, plastics suppliers, and users. Opportunities will be available, according to the Society for Plastics Engineers, for plastics engineers in process development technologies, polymer characterization instrumentation, computer utilization of polymerization and processing techniques, and energy management.

According to Edward Buckley, Education Director for the Society of Plastics Engineers, the demand for plastics engineers is far greater than the supply. He says, "We are getting the impression from the engineering schools that plastics engineers are getting some of the highest salary offers—second only to petroleum engineers. They are averaging around $20,000 per year for a plastics engineer graduating with a B.S. degree."

Only two schools offer undergraduate degrees in plastics engineering. The University of Lowell offers a B.S. degree program in plastics engineering, and Case Western Reserve University has a B.S. degree program in polymer engineering. Pennsylvania State University offers a B.S. degree in polymer science and four other schools offer B.S. degree programs in polymer technology. A large number of schools offer one or more courses in polymers. For a list of institutions offering degree programs or majors in plastics or polymers write

Society of Plastics Engineers
656 West Putnam Ave.
Greenwich, Conn. 06830.

The society recommends that students interested in plastics engineering get a solid background in traditional engineering courses and calculus, chemistry, physics, and mechanics. Other useful courses are computer programming, thermodynamics, and heat transfer. Specialized engineering courses like polymeric materials, plastics processing, mold engineering, chemistry of macromolecules and the physical properties of polymers and polymer structure are recommended if a major in plastics engineering or polymer science is not possible.

University of Florida, Gainesville

According to the Society of Plastics Engineers, less than 20 percent of the college graduates employed in the plastics industry have had any significant amount of formal training in either plastics or polymers. The Society anticipates that the supply of engineers with degrees in plastics engineering will not meet the demand in the near future and that the industry will continue to employ large numbers of individuals with technical preparation in fields other than polymers.

For a copy of "Opportunities in the Plastics Industry for Engineers, Scientists, and Other Technical Disciplines," write to the education department of the Society of the Plastics Engineers at the address given above.

Information on schools of engineering is available from the

Accreditation Board for Engineering and Technology
345 East 47th St.
New York, N.Y. 10017.

Each year, the Board publishes a list of accredited programs leading to degrees in engineering and a list of accredited programs leading to degrees in engineering technology; the lists cost 50 cents each. The Board also has a comprehensive series of career materials for engineers. Write for their publications list.

of an all-day written test and a practical component to assess the candidates' physical examination skills.

Rewards

What kind of earnings can a physician assistant expect? In a word, the answer to that question is "good."

In 1978, PA's just starting work in hospitals earned about $14,700 on the average, according to a national survey conducted by the University of Texas Medical Branch. Typically, the highest pay for PAs in these settings was about $18,000, although some earn as much as $25,000.

In another survey that included PA's in all settings, the Association of Physician Assistant Programs found the average salary to be about $17,000 in 1978. The study also suggested that PA's in health maintenance organizations, hospitals, and physicians' offices earn slightly more than those in clinics.

Veterans Administration (VA) hospitals started PA's at the GS-8 level, or about $15,000 a year in 1980. Advancement in grade is possible to the GS-12 level. The average earnings for all PA's employed in VA hospitals was about $22,000.

Backgrounds and Advancement

The backgrounds of those training to be PA's are diversified. Some are high school graduates and others hold bachelor's or master's degrees. Some have never worked in a health-related occupations, and others are already health professionals, with experience as nurses or medical technologists.

Formal lines of advancement have not evolved within this very young profession. There are no head PA's in hospitals or nursing homes as there are head nurses; by the very nature of the profession, PA's are directly supervised by physicians. Since the supervising physician shares responsibility for the quality of care rendered by the PA, the relationship must be a close one. Therefore a middle level of supervision would be an interference.

Some PA's develop additional expertise in such specialty areas as pediatrics or surgery and assist specialist physicians. These occupations are described in the accompanying box. For most, however, advancement takes the form of the additional responsibilities and higher earnings that come with experience and, sometimes, with completion of continuing education courses.

Yale New Haven Magazine, photo by William B. Carter

Outlook

A survey conducted in 1978 by the Association of Physician Assistant Programs reveals that very few PA's in search of a position were unable to find one that year. New graduates may have to accept jobs in medically underserved areas, but they may not view this as a hardship. Over half of the students in training programs say they would prefer to practice in a small city or town.

Longterm employment prospects for PA's are more difficult to assess. The occupation, though still very small, has experienced extraordinary growth: the number of PA's increased from fewer than 100 people in 1970 to about 9,500 in 1980. But what of the future? Is such rapid growth likely to continue? Will doctors' offices remain the principal place of employment for PA's, or will hospitals, clinics, prepaid health plans, and other settings take on much greater significance? What geographic areas will be most favorable to PA employment? Indeed, how many PA's will be required in the future? Longterm trends in the employment of PA's remain uncertain because of a number of unresolved issues in the broad area of health policy.

Restrictions on reimbursement for the services of PA's is one of the most important questions clouding the profession's future. Studies have established that substituting PA's for some physicians can lower overall payroll costs without reducing the quality of care delivered. However, the majority of health insurance plans—including Medicare and Medicaid in most cases—do not provide for reimbursing a hospital or medical practice for services performed solely by a PA. Understandably, this uncertainty regarding payment makes many hospitals and physicians reluctant to hire PA's.

Another unsettling factor is the diversity of State laws that regulate the kinds of services that PA's may perform. In some States, they have the authority to make medical decisions and prescribe treatment without close physician supervision. In others, they are allowed to practice only under the immediate supervision of a physician and are restricted to prescribing a limited number of drugs. Elsewhere, they are prohibited entirely from writing prescriptions. Furthermore, many of these laws are under review in the State legislatures, and employers are in the position of hiring PA's without knowing what rules and restrictions will govern their use in coming years. This uncertainty discourages potential PA employers.

The supply of physicians also clouds

future prospects for PA's. In the early 1960's the Federal Government launched a series of programs designed to expand the output of U.S. medical schools. There is some concern now that the job may have been accomplished too well. Although projections vary, some health economists warn of a possible physician oversupply by the year 1990. Almost everyone agrees that barring a major increase in demand, such as might be generated by a National Health Insurance program, the number of physicians will probably be adequate to meet our needs. If the number of physicians grows as expected, the patient-loads of physicians will decrease, on the average, and demand for PA's could decline.

An oversupply of physicians might also lead more doctors to locate in areas that are medically underserved, areas where PA's now tend to locate. This phenomenon—the dispersal of physicians to more remote areas—could displace PA's and lower the demand for their services.

However, PA's will probably always have a place in some rural settings. Sparsely-populated areas will always have trouble attracting full-time physicians, and PA service in these areas will remain an important contribution to health care.

Further, some developments could heighten rather than curtail demand for PA's. For example, an increase in the number of prepaid health plans, such as health maintenance organizations (HMO's) holds some promise for future PA employment. These health plans provide complete health care services to members for a set annual charge. Many of these plans are substituting physician assistants for some physicians to cut costs. Because the plan collects payment directly from the client, the problem of collecting fees from insurance plans is avoided. The demand for PA's in these prepaid health programs should provide many opportunities in cities.

The rapid increase in the population over 65 could also have a favorable impact on the employment of PA's. Compared to younger people, the elderly visit physicians more often, spend more money on medicine and drugs, and spend much more on hospital stays. Resolution of the reimbursement issue could lead to greater employment of PA's by nursing homes and home health care agencies that serve the elderly.

Also affecting the outlook for PA's are the enrollments in PA training programs. In recent years, enrollments have leveled off. If current levels are maintained, growth in the field will be limited to no more than 1,500 new PA's annually in the coming years.

Sources of Additional Information

For more information about the profession, send for the brochure, "The PA Profession, What You Should Know." The brochure is available free from the Association of Physician Assistant Programs, 2341 Jefferson Davis Highway, Suite 700, Arlington, Virginia 22022.

Detailed information on individual PA training programs is also available from the Association. The 1979–80 edition of its publication, entitled *Profile,* contains a list of educational programs and accreditation status, a description of each program complete with admission procedures and requirements, national certification information and financial information. *Profile* may be ordered from the Association for $7.50 per copy (payment should accompany order).

For a description of the national certifying examination for primary care physician assistants and eligibility requirements, write to the National Commission on Certification of Physician Assistants, Inc., 3384 Peachtree Road N.E., Suite 560, Atlanta, Georgia 30326.

Specialized Physician Assistants

Most physician assistants (PA's) give primary care while working for a primary care physician, that is the doctor who assumes overall responsibility for the patient's treatment. Some specialty physicians also employ PA's to help with the routine health care such as physical examinations and post-operative care in hospitals, and also to assist during complicated specialized medical procedures.

- **Child health associates.** These mid-level practitioners are also considered PA's. They usually work under the supervision of a pediatrician and are qualified to provide most of the diagnostic, preventive, and treatment services for children who are not hospitalized.

- **Orthopedic physician assistants** work under the direction of an orthopedist (orthopedic surgeon). They provide routine in-hospital or office care to patients with orthopedic diseases, injuries, or problems. They may apply and remove simple casts, braces and traction apparatus; make minor repairs or adjustments to orthopedic devices; and care for equipment in operating rooms. They can also care for minor injuries, prepare patients for surgery, assist the surgeon during operations, and instruct patients in proper use of crutches or in performing exercises.

- **Urologic physician assistants** work under the direction of a urologist and are qualified to provide routine patient care. Duties can include preparing patients for examination or surgery, taking urine samples, preparing urologic instruments and equipment for use by the physician, replacing urinary drainage tubes, and performing or assisting in kidney-function testing. Urologic physician assistants may work in urologic clinics, physicians' offices, dialysis units, or operating rooms.

- **Surgeon assistants** work under the direction of a surgeon and are qualified to prepare patients for surgery, assist during operations, help with the patients during post-operative periods, and care for minor injuries. These assistants may specialize in areas in which the physician has interest, such as chest, head and neck, or general surgery.

- **Emergency room physician assistants** usually are directed by a physician specializing in emergency medicine. They can interview patients and perform most of the diagnostic and treatment services performed by a physician in the emergency room. They also may arrange follow-up care when necessary.

GRAB BAG

Would You Believe a Labor SHORTAGE?

Workers, particularly qualified workers, may be in short supply during the 1980's, according to Dr. Seymour L. Wolfbein, a professor of business administration and economics at Temple University. Writing in the January 1980 issue of Management World, he says, "While the coming of age of the 'baby boom' immediately following World War II resulted in a 35 percent increase in the number of young workers during the 1970's, the 1980's will see a 15 percent decrease in the young labor force due to major declines in the birth rate." It should be noted that Dr. Wolfbein's forecast deals only with new workers, a small segment of the labor force.

Climbing but not Rocketing

Like the skylines of America's cities, the cost of college continued to rise last year; but, judging by a survey conducted by the National Association of State Universities and Land-Grant Colleges, the cost went up less than the average increase in the cost of everything else. The increase in the median charge for tuition, fees, room, and board at major public universities was 5 percent, compared to a 9.3 percent increase in the Consumer Price Index between July 1, 1978 and July 1, 1979.

Median total charges for a State resident attending State and land-grant universities were $2,333 in 1979; nonresidents paid $3,667.

Employers Can Take Credit

Counselors and others engaged in job development--that is, people who do not just refer clients to jobs but find jobs for them--have two new tools to help them persuade employers to hire the disadvantaged: The Targeted Jobs Tax Credit and the WIN Welfare Tax Credit. The two programs work about the same. Through them, an employer who hires someone in one of the targeted groups can claim a business expense deduction on their taxes for some of the new worker's wages. The deduction, which equals 50 percent of the new worker's salary, can be as high as $6,000. The actual value of the credit depends on the employer's tax bracket, but it can amount to as much as $2,580. In the worker's second year of employment, 25 percent of the worker's salary can be claimed as a deduction.

Employers can only claim the credit if the Job Service or State employment security agency has certified that the new worker is a member of one of the following groups: (1) Youth aged 18 to 24 in economically disadvantaged families; (2) youth in cooperative education programs who attend school part time and work in related jobs part time; (3) handicapped persons referred from State vocational rehabilitation agencies or the Veterans Administration; (4) ex-convicts who are economically disadvantaged and hired within 5 years of conviction or release from prison, whichever is later; (5) economically disadvantaged Vietnam-era veterans; (6) welfare recipients; (7) recipients of Supplemental Security Income (SSI); and (8) recipients of Aid to Families With Dependent Children.

More information on tax credits may be obtained from local Job Service offices, listed in the State government section of the telephone book.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1980 O— 311-407/7

Directory of National Unions and Employee Associations, 1977

Bulletin 2044

This Bureau of Labor Statistics directory lists names and addresses of:

- National and international unions
- State labor organizations
- Professional and public employee associations, their officers and key officials, publications, information about their conventions, membership, and number of locals.

Factbook section of the publication includes a report on developments in the labor movement, 1976-77, and facts about the structure of the labor movement. Information about the level, trend, and composition of membership is supplied by the participating organizations. Extensive statistical appendixes are included.

U.S. Department of Labor
Bureau of Labor Statistics

Fill out and mail this coupon to BLS Regional Office nearest you or Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.
Make checks payable to Superintendent of Documents.
Publications may also be charged on Visa or Master Charge credit cards. Include card number and expiration date.

Please send _____ copies of **Directory of National Unions and Employee Associations, 1977.** Bulletin 2044, Stock no. 029-001-02425-8, price $4.50. (Discount of 25 percent is given when orders of 100 or more are sent to one address.)

☐ Remittance is enclosed ☐ Charge to GPO deposit account no._____

Name_____

Organization (when appropriate)_____

Address_____

City, State, and Zip Code_____

pare several different newspaper ads each day, as well as radio and TV advertising, special advertising inserts for newspapers, catalogues, and other promotional material.

Some advertising workers are employed by the various media such as publishers and broadcasters. They persuade advertisers and advertising agencies to buy advertising space or time. *Space or broadcast-time sales workers* call on advertisers and advertising agencies. Like all sales workers, they must have good sales ability. They also must be familiar with the characteristics of the users of the medium being sold and with the advantages of their own publication or station over others. They make up a significant proportion of all advertising workers, and this position can be a good point of entry into the field.

Job Locations

New York City is the undisputed capital of the advertising industry, and most national advertising is prepared there. However, other cities, notably Chicago and Los Angeles, also are large advertising centers. The employment of those who work for advertisers and the media rather than agencies is less concentrated. However, because New York also is the center of the broadcasting and publishing industries, as well as the site of many corporate headquarters, it also has a concentration of nonagency advertising people. Although many smaller cities have some advertising workers connected with local media and retail firms, towns and rural areas have virtually none.

Advantages and Disadvantages of an Advertising Career

Anyone contemplating a career in advertising should have a clear idea of advertising's role in the economy. Advertising exists to sell things. It oils the wheels of the economy by informing and reminding potential customers of the desirability of particular products. Without advertising to develop the markets necessary to support mass production our present standard of living would probably

not be possible. If you do not feel that advertising serves a useful purpose, you will probably be unhappy in this line of work. This is also true of people who cannot separate their personal preferences for a product from their professional responsibilities, because advertising workers cannot generally choose the accounts they work on.

A career in advertising offers many advantages. Successful advertising workers can advance rapidly and can earn high salaries, while using their artistic, literary, and other creative talents. The work offers continued variety and there often are new and interesting challenges. Advertising workers also find satisfaction in seeing their work in print or on television or hearing it on the radio, knowing that it increased sales for the product, and being associated with campaigns that receive wide public attention.

The large variety of jobs in the advertising field makes it difficult to generalize about earnings. However, based on the limited amount of salary data that is available, college-trained beginners can generally expect to start at $10,000 to $12,000 per year and, within 3 or 4 years, advance to roughly $20,000 per year. Many never last that long, however, in this competitive field. Account executives with 5 to 10 years' experience make between $24,000 and $40,000; and for higher level executives, salaries range from $40,000 to several hundred thousand per year.

The disadvantages of a career in advertising include competition, pressure, and insecurity. This is a very competitive field. While it is possible to advance quickly, it is also possible to fail quickly. The pressure to produce effective advertisements is constant. Those who are unable to make significant contributions continually are quickly put into dead-end jobs or fired. Even successful performers experience much job instability, since layoffs are common when an agency loses a big account and during business slowdowns.

Preparing for an Advertising Career

There is very little agreement on the best preparation for an advertising job. Hiring practices are influenced by the agency's size and organizational structure and, perhaps most of all, the employer's past experiences with new employees. As a general rule, a bachelor's degree in the liberal arts or business is the usually accepted minimum requirement. A liberal arts or business education should help supply the writing and communications skills essential to advertising. Although a major in advertising is not required, a few advertising or marketing courses taken as electives can help the student learn fundamentals and will demonstrate to prospective employers a commitment to the field.

A growing number of agencies prefer to hire applicants with a master's degree in business administration (M.B.A.), especially for management or management trainee positions. Many employers feel that M.B.A.'s with a marketing background are better equipped to plan, organize, and coordinate the ad campaign than those without this training. In today's highly competitive job market, the M.B.A. can be an advantage.

A jobseeker's greatest asset, of course, is experience. Most people in the field agree that the best way to learn advertising is to do it. Many employers believe that the ability consistently to create ideas for effective ads is a flair that cannot be taught. Because employers look for workers with this flair, they often give preference to applicants who have some work-related experience. Appropriate summer and part-time jobs, as well as extracurricular activities, can provide this experience. However, although a part-time job with an ad agency or in the advertising department of a retail firm is ideal, they are very scarce. But a sales job can provide valuable experience, because advertising is a form of selling. Writing for a college newspaper is also considered good experience, as is selling ads for the paper or college radio station.

Because the advertising field is so competitive, it is common for jobseekers, especially those without experience or graduate training, to take low-level jobs that probably would not be considered acceptable by college graduates in many other fields. There is a long history of people starting out as layout workers, clerks in a media department, secretaries, or typists and working their way up once they gain experience and demonstrate talent. Much of the famed job hopping in advertising occurs because young workers move around seeking varied experience and advancement opportunities. Many agencies are small and cannot afford to train inexperienced workers. Large ad agencies, retailers, and media firms, on the other hand, can hire people for low-level jobs, and give them increasingly responsible tasks if they have talent. As they become experienced, they can then move among both large and small firms in search of advancement. These workers can advance as far as their talent will carry them, but as a general rule, they will not rise as fast as those accepted directly into the management training program of the large firms.

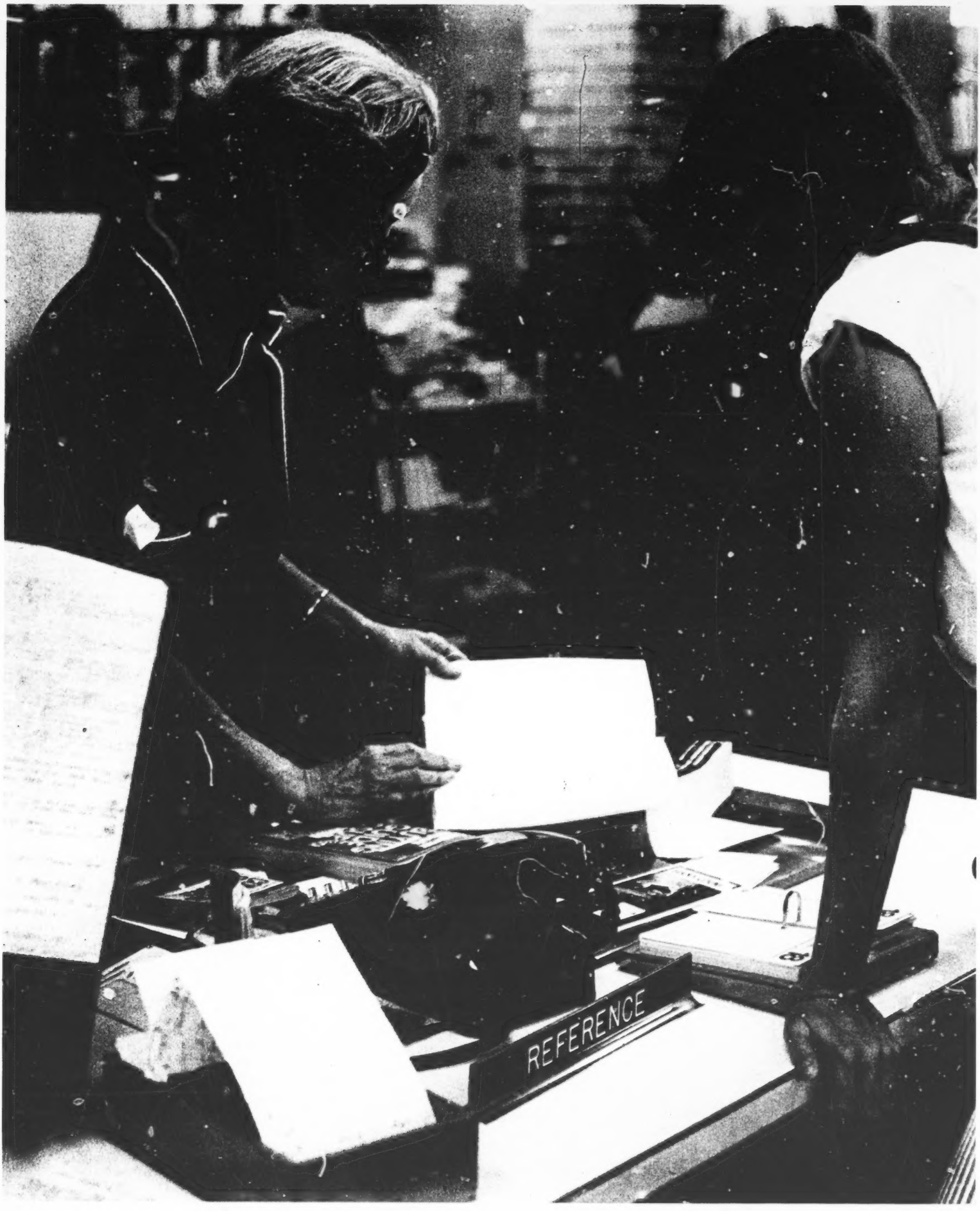
Employment Outlook

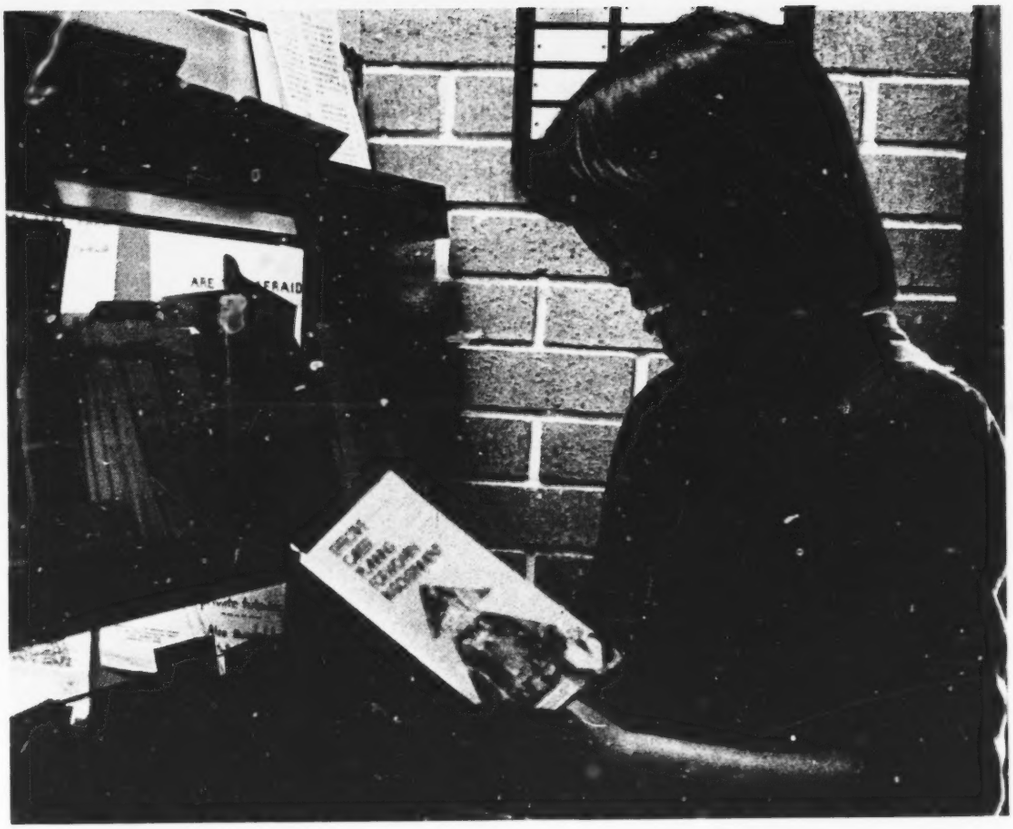
Those entering this field will doubtless continue to encounter keen competition, although an accurate assessment of future supply cannot be made. The excitement and glamour of advertising, along with the potentially high monetary rewards, attract many jobseekers. And because anyone with a liberal arts or business degree is qualified to enter, applicants always outnumber openings. The link between employment and the health of the economy also adds significantly to the tight job market for advertising workers. In a recession, companies generally reduce expenditures for advertising, which in turn forces ad agencies and retail firms to lay off many workers. Unlike the situation in many other industries where layoffs primarily affect production workers, advertising layoffs affect everyone. A highly paid account executive and an inexperienced layout worker both can be fired if the agency loses a large account. People who have been laid off can usually find another advertising job. However, while they are unemployed, they add to the competition faced by newcomers to the field.

Sources of Additional Information

The American Advertising Federation, 1225 Connecticut Ave. NW., Washington, D.C. 20036 has available for 50 cents the pamphlet, "Jobs in Advertising." It can also supply "Questions and Answers About Advertising" for 50 cents and "Where Shall I Go to College To Study Advertising?" for $1.00.

The American Association of Advertising Agencies, Inc., 200 Park Ave., New York, N.Y. 10017 has two pamphlets available for 60 cents each: "Careers in Advertising" and "Advertising Agencies—What They Are, What They Do, and How They Do It."


REFERENCE



one library had at least 10 copies of a popular job hunting manual.

The librarian should consider the value of the publication compared to its cost. How far will one resource stretch compared with another of the same price? For example, a pamphlet or booklet series is accessible to more people at one time than a bound volume. Eleanor Lent, Director of the Reentry Women's Employment Center of Fairfax County says, "Few librarians know of, or buys the excellent Catalyst series which is very good and relatively inexpensive." The series of 52 publications is published by Catalyst, a nonprofit organization which helps women find careers.

Organizing Materials

The librarian must establish some principle to govern the arrangement of all career-related material. Once materials are ordered and received, they must be treated in a uniform manner. Books may be removed from the general collection and grouped together or filed in the collection but noted on bibliographies.

Most librarians are familiar with vertical files—any collection of pamphlets, clippings or other unbound materials stored in filing cases or similar containers. A book such as *The Vertical File and Its Satellites: A Handbook of Acquisition, Processing and Organization* by Shirley Miller, can be helpful in undertaking the task of setting up a file. This guide on organizing files is full of useful hints and guidelines, from how to choose filing cases or formats to what materials should be included and how they should be labeled. A special chapter on vocational material discusses in detail the pros and cons of organizing the vertical file alphabetically or according to *Dictionary of Occupational Titles* (D.O.T.) codes. Also check Wilma Bennet's *Occupations Filing Plan,* 3rd edition 1968, by Interstate Printers and Publishers, Danville, Illionois 61832 ($3.95).

In reviewing and cataloging materials, make sure the name and address of the publishing organization are prominently visible. Record this information from envelopes and packing materials before they are discarded if necessary. This information is important to acquaint the staff and public with the purpose and background of the publishing organization and also to provide information to patrons who wish to secure their own copies of the materials.

It's also a good idea to stamp the material with the date it's received. Although publication dates are not always available, at least dating material when it's received gives some indication as to when the publication was actively distributed.

Librarians must review materials periodically, as time permits, to ensure their currency, authority, and appropriateness. While culling the vertical file, the librarian should note which publications are published annually and check to see if these have been reordered. The librarian should quickly review each item. It is not enough to merely check the date of the publication, since some publishers do not revise as often as they should. Old statistics can be "concealed" in a pamphlet with a recent publishing date. Another weeding technique is to check the contents of folders to be refiled after the patron's use.

Other Resources

Besides acquiring printed materials, the librarian can use ingenuity in creating and collecting other valuable materials for jobseeking patrons. The advantage of most of these other resources is their price—free, except for the staff time involved in preparing them.

Some libraries that organized federally funded job information centers offered patrons "job survival kits." These consisted of short mimeographed booklets on various topics of interest to jobseekers such as how to write a résumé and handle job interviews. Listed throughout the kits are the books in the library's collection and the Dewey decimal number needed to locate the books. This type of booklet could be produced in most libraries, especially since many libraries receive a generous amount of free photocopying from companies which place photocopy machines in the library for patron's use.

Many librarians have responded to the needs of jobseekers by preparing bibliographies on selected topics which list pertinent books in collection. Preparing them is a natural adjunct to the evaluation and acquisition processes

THE GREAT WOMANHUNT

Women now make up 10 to 20 percent of all engineering students, and competition for them is keen.

by Ann Seltz-Petrash

If you are a woman engineer, graduating in the 1980's, your talents are needed and wanted. You've made a wise career choice. Your starting salary will be higher than that of your non-engineer friends (today's average woman engineer's starting salary is $17,172) and you are in one of two fields where women's starting salaries equal men's.

You will find yourself in greater demand than ever—and the demand is climbing steadily.

According to Joe Appleton, an engineering professor at the University of Alabama, engineering students in 1978 received 55 percent of the job offers on campus, although they represent only 8 percent of the graduates. Says Appleton, "We will need approximately 60,000 graduating engineers per year in the 1980's and the 1978 B.S. engineering graduates numbered only 43,000."

Appleton believes the qualified white males who are capable of being and who want to be engineers are already enrolling in engineering. This leaves the barely touched resource of women and minorities.

The Endicott Report, a survey of 102 major national firms published yearly by Northwestern University, shows that more than 90 percent of the surveyed firms plan to hire at least as many female graduates as they employed in 1978. At the same time, these firms cite the lack of female candidates in science and engineering, and the intense competition for those employees.

So graduating women engineers are joining an elite group. But if current trends continue, that group may not be small much longer. Since 1971, female enrollment in engineering schools has increased 300 percent. Women now constitute from 10 percent to 25 percent of the engineering students currently in school, and fewer women are transferring out of engineering than in the past years.

The growing number of women in engineering is due to several factors. First, when firms began seeking women graduates after 1971, there were not enough to go around (even at token hiring levels). Firms began pressuring universities for more women. At the same time, beginning in 1972 and increasing each year thereafter, universities began experiencing a student shortage in most curricula. Engineering was particularly hard hit because after the post-space-age letdown there were not enough jobs for engineers and enrollments decreased. The demand for engineers reappeared before there were enough students to meet it. So engineering schools began recruiting women and minorities.

College recruiting has taken several routes. Georgia Institute of Technology has established dual-degree programs, working with several other colleges in the area, primarily women's colleges. These are 5-year programs; women spend 3 years at one college majoring in science and 2 years at Georgia Tech studying engineering. Graduates earn two degrees: one in science and one in engineering.

Georgia Tech recruits in high schools as well. According to William Sangster, Dean of Engineering, Georgia Tech mails 11,000 to 12,000 letters annually to women and minority student National Merit Scholarship winners. The letters give information about engineering and the school and provide the student with the name of an engineer in her/his area. The recruiting effort has been very successful. In 1972 there were only 100 women engineering students at Georgia Tech; by 1978 the number has soared to 1,200.

Jim Yao, professor of civil engineering at Purdue University, says that 10

Ann Seltz-Petrash is a staff writer for *Civil Engineering* magazine, the publication for the American Society of Civil Engineers.

Reprinted from *Graduating Engineer*, Fall, 1979.
Copyright, McGraw Hill, Inc. All rights reserved.

Carnegie-Mellon University Department of Public Relations photo by Dave Steidl

years ago the few women students he taught were exceptional achievers. It was rare to give a grade lower than B to a female civil engineering major. Now, he continues, women's grades are closer to the men's, although their cumulative average is still slightly higher.

At Michigan Technical University, engineers represent half the enrollment. Michigan Tech runs an active recruitment program for women. Science and math high school teachers are asked to recommend women with good skills. About 1,000 are recommended and 100 participants are finally selected to attend a summer orientation program. During the 5 days, students are introduced to the branches of engineering, lectured to by practicing engineers and allowed to participate in some lab and field work. About two-thirds of the women who attend these orientations actually enroll at Michigan Tech as engineering majors.

Once women are enrolled in engineering, the trick is to keep them there. Although there is nothing wrong with their skills (in 1976 the American Institute of research study states that at the time of high school graduation there was little difference in science and math ability between male and female students), engineering can be a lonely major.

In the early 1970's, women were still rarities in engineering. In 1972, only 30 percent of the women beginning college as engineering majors graduated as engineers, compared to a 55 percent retention rate for men. By 1976, according to Mary Ott, a researcher at Cornell University, the difference in retention rates had narrowed to a 5 percent gap. In fact, one of the reasons women engineers are not as visible as the growing enrollment statistics would indicate is that so many do not graduate as engineers.

Those who transfer are not less capable than those who stay, according to a survey by The American Society of Civil Engineers. Many leave because of financial burdens, some leave to marry, and some leave because it is uncomfortable to be a minority for 4 years. Others leave for the traditional reasons students drop out of school or change majors.

Since 1975, universities have been taking steps to keep their hard-won female engineering majors. Many schools now have special counseling programs for women. Scholarships and other forms of financial aid have also been targeted for women. Cornell University offers a skills lab to help women become familiar with machines and tools.

Many schools are also developing "retread programs" that encourage women who dropped out of engineering to marry and have children to take up engineering again. And programs are designed to help women who have been out of the job market catch up on technical skills. The National Science Foundation has sponsored several of these programs.

Two other factors, more difficult to document, have had as significant an effect on the rise of female engineering majors as have university recruiting efforts. These are the shortage of jobs in "traditional women's jobs"—teaching and social sciences—and the changing consciousness of women themselves.

Traditionally, women with strong math and science skills have been slotted directly for junior and senior high school teaching (occasionally junior college and rarely university). But as the post World War II baby boom slowed and then ended, there weren't enough teaching jobs to go around. Jobs in other women's fields—nursing and social science—were also scarce. The shortage was aggravated because in a tighter job market male science and math teachers were hired first, so women were left with little choice but to widen their horizons.

CAREERS
IN COMMODITY FUTURES TRADING

by Gail M. Martin

Chicago Mercantile Exchange

Each day more than 100,000 commodity futures contracts are traded on the floor of the Chicago Board of Trade—the world's largest commodity futures market. The action is fast and furious; all business is completed in less than 5 hours. Floor brokers signal with their hands as well as shout bids aloud.

A typical transaction proceeds as follows: An order to sell one contract—5,000 bushels of March oats—at $1.50 per bushel is sent down to the floor broker. In the pit, March oats are only going for $1.45½ per bushel so the broker decides to wait it out. Meanwhile, the broker sees an opportunity to execute two other "buy" orders. The broker yells "Take it!" to a broker who's offering July oats at $1.55 per bushel. The broker gets involved in recording the required information on the trading card. In the meantime, the price of March oats has shot up to $1.52 per bushel. Before the broker can jump in with a bid, another broker yells, "Sold!" The first broker has "missed the market," as they say on the floor.

The trading of commodity futures contracts takes place at 10 other exchanges in the United States besides the Chicago Board of Trade. The exchanges, which are similar to stock exchanges, each have their own members, administration, and regulations regarding trading. They are located principally in Chicago and New York City, but there are also exchanges in Minneapolis and Kansas City, Missouri. The New Orleans Commodity Futures Exchange is due to open by the end of 1980, pending approval by the Commodity Futures Trading Commission (CFTC).

Today, a futures contract is basically the same type as that which evolved at the Chicago grain market in the 1800's. It is an agreement to deliver or receive a set quantity and quality of a commodity on a given date in the future. While all the money for the purchase is not due until the commodity is actually delivered, the buyer and the seller of a contract each put down about 5 to 10 percent of the total value of the contract at the time of purchase. This is called margin money. Contracts may be traded many times, and most traders sell theirs before the delivery date, so that they rarely take possession of the actual commodity.

Trading on the floor of the exchanges takes place in trading pits, or rings, each of which represents a particular commodity. Also on the floor are

---

Gail M. Martin is an OOQ staff writer. "You're A What? Commodity Broker," appearing elsewhere in this issue, tells more about this industry.

members' stations, market information centers, and telecommunications centers.

Pit runners at member stations relay trading orders which are wired or phoned to floor brokers. Upon execution, the floor broker endorses the price on the order form which the runner returns to the member station to be teletyped or telephoned to the account executive who, in turn, calls the customer. Overlooking the pit, recorders keep track of and post price changes as they occur. The whole process of executing an order "at the market"—the price then current in the pit—takes less than 2 or 3 minutes.

To Market, To Market: A Burgeoning Industry

In recent years the commodity futures industry has boomed. In 1960, 4 million futures contracts were traded. Over thirteen and a half million contracts were traded in 1970, and in 1979 the number of contracts traded was up to nearly 76 million.

The meteoric growth in the commodity futures industry has largely been due to two reasons: Speculating and hedging. In an economy which experiences rapid price changes, speculators seek to make a profit in buying and selling futures contracts. They buy at a low price and sell at a higher price later. On the other hand, commercial users, such as large corporations, or, more recently, financial institutions, seek to protect their investment in inventory and their future business profits by hedging. A company hedges in many ways. A common hedge is the selling of futures contracts in amounts equivalent to the company's actual inventory of the commodity. Hedging is also done by purchasing futures contracts to eliminate or lessen loss from the possible price rise of raw materials or commodities not yet owned but needed to fulfill processing or other commitments.

Another reason for the growth in the industry is the addition of many new commodities over the past 10 years. According to Bill Paulek, Chief of the Registration and Qualifications Division of the CFTC in the Chicago regional office, the boom started with pork bellies. He says, "About ten years ago a doctoral dissertation was done on the feasibility of trading pork bellies—which are frozen uncured bacon products from slaughtered hogs. It turned out to have far-reaching implications because other commodities were introduced on the same basis. Not only was trading pork bellies successful, but so was the trading of hogs and assorted other commodities for the first time."

Initially, most futures trading was in domestically grown agricultural products, but over the years this has broadened so that by December 1979, trading of 118 contracts in 58 different commodities was approved by the CFTC. The contracts included forest products, agricultural products, and financial instruments such as Treasury bills and Government National Mortgage Association (GNMA) certificates. Many of these commodities, such as soybeans and wheat, have become increasingly important in international trade. And, because of inflationary trends throughout the world, the trading of gold and silver futures contracts has become extremely active.

The industry in recent boom years has increased not only in volume but also in complexity. As many industry insiders say, the business is not easy. Trading moves very fast and price rises and declines may happen quite quickly. Over 30 of the commodities traded are "short life" products (perishable goods) which react—sometimes violently—to outside factors called fundamentals. For example, fundamentals that affect grain are weather, plantings, crop conditions, policies of the U.S. and foreign governments, demand—both at home and abroad, cost and availability of transportation, and a myriad of other factors. To understand and predict these fundamentals requires an army of advisory experts in addition to those who deal with the mechanics of trading on each market and on each exchange. Their research, advice, information, and expertise make the market run briskly and smoothly.

The Workforce

Brokerage houses employ many workers. David T. Johnston, Senior Vice President of E. F. Hutton & Co., says, "Today almost every major Wall Street firm either has or is planning a commodity department and is actively attempting to develop this business. Numerous firms that have never been in the futures business before are attempting to develop futures departments. With the advent of growing markets in financial instruments, it seems likely that all major Wall Street firms will be heavily involved before long."

The CFTC's Bill Paulek estimates that roughly 45,000 persons are employed in businesses and organizations directly involved with the commodity futures industry. This estimate is necessarily rough since many companies deal also with stocks and securities, so some employees are not employed exclusively in the commodity futures industry. Also, there is no exact number available for support person-

U.S. Department of Labor
Bureau of Labor Statistics
Washington, D.C. 20212

Official Business
Penalty for Private Use, $300

Postage and Fees Paid
U.S. Department of Labor
Lab-441

SECOND CLASS MAIL

University Microfilm International
Serials Processing Department
300 North Zeeb Road
Ann Arbor, Michigan 48103

THE JOB HUNTER'S GUIDE TO THE LIBRARY

by Gail M. Martin

The public library nowadays doesn't lend just books. Public libraries collect and lend records, pamphlets, films, and even artwork. Increasingly, libraries are also accumulating extensive information on careers and the world of work. Hence, the nearest career information center may be as close as your public library.

Libraries are ideal for career research since their hours are generally very good—almost everyone can find some time when they're free and the library is open. In addition, most services and materials in the library are free. Moreover, with the possibility of inter-library loans and the growing cooperative arrangements among libraries, access to books and materials is increased many times for the library patron turned job hunter. All these features make the library a good place to start the sometimes difficult tasks of choosing a career or finding a job.

Tips on Using the Library

The first step in using the public library for career information is to discover what materials are available in the collection, and how to locate and use these materials. Talk with the librarian in charge to get the full benefit of the library. He or she will be very familiar with these procedures.

Asking for help is also a good idea for several other reasons. The librarian will know not only what is in the collection, but what particular items will be of most use to the patron. The librarian will also have quick access to the most current information in the collection. Often books that are very useful do not circulate. For example, most libraries own the *Occupational Outlook Handbook* but many libraries keep the current edition in the reference section—frequently behind the reference librarian's desk. Patrons are sometimes asked to leave an I.D. to use it.

A second basic rule in using the public library for career information is to allocate a sufficient amount of time to explore the resources. All library work is investigative and often the best information or source is turned up only after a patient search. Of course, this doesn't mean jobseekers need to read each book or pamphlet of interest thoroughly. Using the book's index and table of contents first is often the proper method and a time saver. Patrons should avoid hurrying while still being selective.

One of the first good resources for job information that most public libraries provide is the bulletin board, which may be located in one of the entrances to the library. Frequently posted on the bulletin board are job vacancy announcements for local governments, as well as the U.S. Employment Service's *Occupations in Demand*, a comprehensive listing of jobs most frequently requested at 2,500 Job Service offices around the country. For each occupation, it provides information on local areas having large numbers of openings, industries requesting workers, pay ranges, and average number of openings available. It also lists jobs not requiring previous work experience.

The bulletin board is likely to feature notices of pertinent workshops on developing job-finding skills. Also posted may be brochures on counseling services available free or at nominal cost at local colleges or universities.

Libraries may have racks containing brochures and pamphlets of interest to the local community. Many of these are useful to jobhunters. Often located here are community college evening division schedules featuring classes in vocational guidance or professional development. For example, one schedule posted recently at a large community public library listed these courses: The Federal Government's Professional and Administrative Career Examination (PACE) Preparation, Teachers in Transition, Programming in Basic Computers, Certified Professional Secretary Exam Prep, Exploring Data Processing Careers, and Word Processing and Automated Office Techniques. Another flyer on the brochure rack in the same library listed the facilities and services available at a local employment center for women reentering the job market.

In response to the many questions from library patrons on the availability and location of career and vocational materials in the library, some libraries have put together specific bibliographies on the library's collection. These are helpful since they often indicate the call numbers and Dictionary of Occupational Titles (D.O.T.) code numbers. Sometimes the bibliography will be on a particular career field. For example, one library featured a bibliography on "Careers in Music." (See box on page 16.) Or, a bibliography will be aimed at a special group of jobseekers—one library offered a 12-page bibliography called "Guide to Re-entering the Workforce," aimed at women returning to work.

The record catalog may be the next stop for the jobseeking patron. More and more libraries, especially those in county systems, are establishing record collections. Some useful records may be found on self-improvement topics: Increasing typing and dictation skills, selling techniques, speaking style, and foreign language fluency.

Some libraries do have one or more typewriters available for public use. If the job hunter does not own a typewriter, he or she should telephone the library in the most convenient location and ask about using a public typewriter. Letters of application, résumés and other items may be typed in the library and photostatic copies made.

Most libraries that earnestly collect career materials have special files, sometimes called "vertical files" by librarians because of their format. The librarian can explain how these are organized, whether by D.O.T. codes, alphabetically, or otherwise. The material collected in these files can be quite varied: occupational briefs, career literature from professional associations, bibliographies, and even articles from newspapers or magazines. Some libraries include articles on individual companies or employers.

Gail M. Martin is an OOQ staffwriter.

since the librarian first becomes familiar with materials in the collection to assess what's needed. One county library system prepared a guide called, "Where to Find What About Careers and Vocational Guidance in the County Library System," that listed colleges, college catalogs, general career and vocational guidance materials, and special collections and services for the whole library system. Alongside each category were telephone numbers of which libraries offered the material. Another county library put together a 23-page bibliography called "Guide to Reentering the Work World," for women in the community who were taking a course on occupations. The course referred to D.O.T. codes which the reference librarian correlated with the Dewey decimal numbers of the library's classification system.

Other types of bibliographies can be useful. For example, a bibliography offered by a university library which many adults patonized was called "Careers in Music." This bibliography had a relatively simple one-page format. (See box). A list of books on music was followed by a list of music books in the general reference collection with call numbers. Also included was a list of relevant journals and periodicals in music.

Besides specialized and general bibliographies, librarians can compile a list of periodicals by occupation and indicate which ones contain classified advertisements or a calendar of events. Another useful tool is a list of subject headings for patrons to check in the card catalog for further information. (A suggested list is given on page 9.)

Librarians might also wish to put a staff person in charge of clipping pertinent career articles from newspapers. Mrs. Jean Joseph, librarian at a regional public library says, "One never has enough information on companies and employers. Fortunately, I have a very good librarian on my staff who is getting a master's degree in business administration. She clips out newspaper articles on companies and pertinent topics for our files and always has an eye open for useful information." These could be articles on particular fields or on companies that appear in the business section of the newspaper.

Some Libraries Prepare Career Bibliographies on Special Subjects

Careers in Music

The following is a select list of materials on Music Careers which can be found in the North Campus Library.

General

Ref HF 5381 .A103 1978/79	*Occupational Outlook Handbook.* General guide and basic information on all careers including the arts.
Ref ML 3795 .A82 1976	*Careers in Music.* 1976. Covers careers in music education, business, the performing arts and allied music fields

Music Reference Collection

Ref ML 19 .H37	Harris, Ernest, E. *Music Education*; a *Guide to Information Sources.* 1978. Bibliography includes sources on careers.
Ref ML 3795 .C8 M8	Csida, Joseph. *Music/Record Career Handbook.* 1973. Covers the creative aspects, commentary careers, business and education.
Ref ML 3790 .S5 1977	Shemel, Sidney. *This Business of Music.* Revised edition 1977. Covers all aspects of the music and recording business. Includes 1976 copyright law and contract forms.
Ref ML 111 .R39	Bradley, Carol. *Reader in Music Librarianship.* 1973. Includes material on music librarianship as a career.
Ref MT 67 .S657 1979	Brohaugh, William. *1979 Songwriter's Market.* 1979. Handbook for songwriters. Covers the profession, marketing techniques, grants, publications.
Ref NX 397 .D68 1978	Artists Foundation, Inc. *Money Business Grants and Awards for Creative Artists.* 1978. Guide to grants for individuals in all of the arts, including music.
Ref ML 13 .D57 1978-80	*Directory of Music Faculties in Colleges and Universities, U.S. and Canada.* 1978-80. Includes an index to Graduate Degrees in music, as well as a listing of Schools of Music.

Journals

American Music Teacher
Clavier
Hi Fidelity/Musical America
Instrumentalist
Music Educators Journal
Music Journal

Source: George Mason University Library, prepared by Jan Giesecke.

Clippings can then be filed in the vertical file or displayed on a bulletin board.

For some patrons, a notebook containing copies of job application forms from local businesses and organizations can be useful to indicate information required on application forms. This notebook could also include U.S. Government Standard Form 171.

If the library has such resources, the librarian may consider videotaping an orientation to the career information center. Or, patrons may wish to practice interviewing techniques in the library and use videotapes to improve their performance.

Some librarians have organized successful workshops on job related topics. City libraries particularly have had good response to noontime "brown bag" workshops. Speakers include representative of private employment agencies, college career counselors, and personnel specialists from industry. Some libraries videotape these sessions to add to the career resource collection.

Librarians may wish to compile a list of all community agencies, including organizations that have employment programs for special groups—women, the disadvantaged, veterans, the retarded, senior citizens, and youth. This list can be gathered from telephone directories, by personal contact, through mail surveys, and from other sources. A card file giving the name of each organization, its address and telephone number, a contact person, and services offered can be far more valuable than one might realize. One library discovered that the adults most in need, particularly the least skilled, were the least informed on agencies and programs that could help them.

Administration

Numerous decisions must be made in administering a career resource center. A prime decision is how the center will be staffed. Or, if there is no organizing of resources within a centralized location but a concerted campaign to collect materials for a vertical file or to compose bibliographies, what staff will be assigned to the projects. Many times budgetary considerations will play a part in the librarian's decisions. Clerical personnel can be a big help once a system for acquisition and cataloging is established.

The professional librarian also may influence the appeal resources will have for to patrons. How visible are most of the materials? Graphics and a well-labeled display board can help. Posters from the Bureau of Labor Statistics advertising occupational outlook publications are available. Other publishers have similar posters. Staff persons can make posters recommending certain books, magazines, or newsletters. A rack of pertinent publications from community agencies may be appropriate here. Consideration should be given to ease of access. Comfortable seating and a desk or table space are also necessities.

The librarian must decide what, if any, vertical file materials will circulate. For a good discussion of the pro's and con's of this topic, see Miller's *Vertical File Index and Its Satellites.* The librarian also will decide which books will circulate and which ones should remain in the library for reference use only.

The librarian will also decide how beneficial a self-help type center would be to the average patron in the community. For some people, asking for information can be painful. Other persons simply prefer to find things on their own. How bibliographies and free materials are displayed can entice these persons into using the library's resources.

Indeed, collecting career resources in one area and the encouragement of their use, are sure to bring a side benefit to the library: Increased patronage. Getting into the act of helping people get jobs brings the public library and the librarian to the heart of the community itself. No librarian could ask for more.

For more help and information, librarians may wish to consult some of the following publications or directories:

1. *Current and Forthcoming Occupational Outlook Materials,* Bureau of Labor Statistics. Available free from U.S. Dept. of Labor, Washington, D.C. 20212.

2. *A Counselor's Guide to Occupational Information,* a bibliography of Federal career information, annotated, Bureau of Labor Statistics, 1980. Also available from any regional office of BLS; see front over for addresses. The Guide may also be ordered from the Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

3 .*Counselor's Check-Up List* (Revised) 1978—12 pp. $2.00, very comprehensive, available from B'Nai B'rith Career and Counseling Services, 1640 Rhode Island Avenue N.W., Washington, D.C. 20036.

4. *Dealing in Futures: Career Education Materials for Students, Parents and Educator's* April 1977, $1.00, a bibliography with annotations by Mary DeWitt Billings and Janet Rubin, HEW Publication No. (OE) 77-01602, GPO Stock No. 017-080-01721-1. May be ordered from Superintendent of Documents, Government Printing Office, Washington, D.C. 20402.

5. *Educator's Guide to Free Guidance Materials,* annual, paperback $9.75. Published by Educator's Progress Service, A4A, Randolf, Wisconsin 53956. See the section on career planning materials, pp. 265-85.

6. *Guidelines for Developing a Career Resource Library,* $2.50 plus 50¢ postage. Prepared by Catalyst, 14 East 60th St., New York, N.Y. 10022.

7. *Information Resource,* bibliography of educational directories including alternative education guides. Available from College Entrance Examination Board Publications, Box 2815, Princeton, N.J. 08541.

8. *Occupational Information: Where To Get It and How To Use It in Career Education, Career Counseling, and Career Development* 4th edition, 1976, by Robert Hoppock. Published by McGraw Hill Book Company, $19.95. See also Chapter 6, "Classifying and Filing Occupational Information," pp. 51-68.

9. *What Shall I Order for Our Career Planning and Placement Library?,* 1976. Suggested publications for small, medium, and large college placement center libraries, College Placement Council, P.O. Box 2263, Bethlehem, PA. 18001. Members, $2.50, nonmembers $4.00.

WRITERS AND EDITORS:

OR, OH YE SCRIBES & SCHOLIASTS

by Shirley Rudney

Think of a word. Think of another. Put them on paper. Presto! You're a writer. Professional writers, obviously enough, are simply people who make a living by putting words together. Editors make a living by prodding the writers.

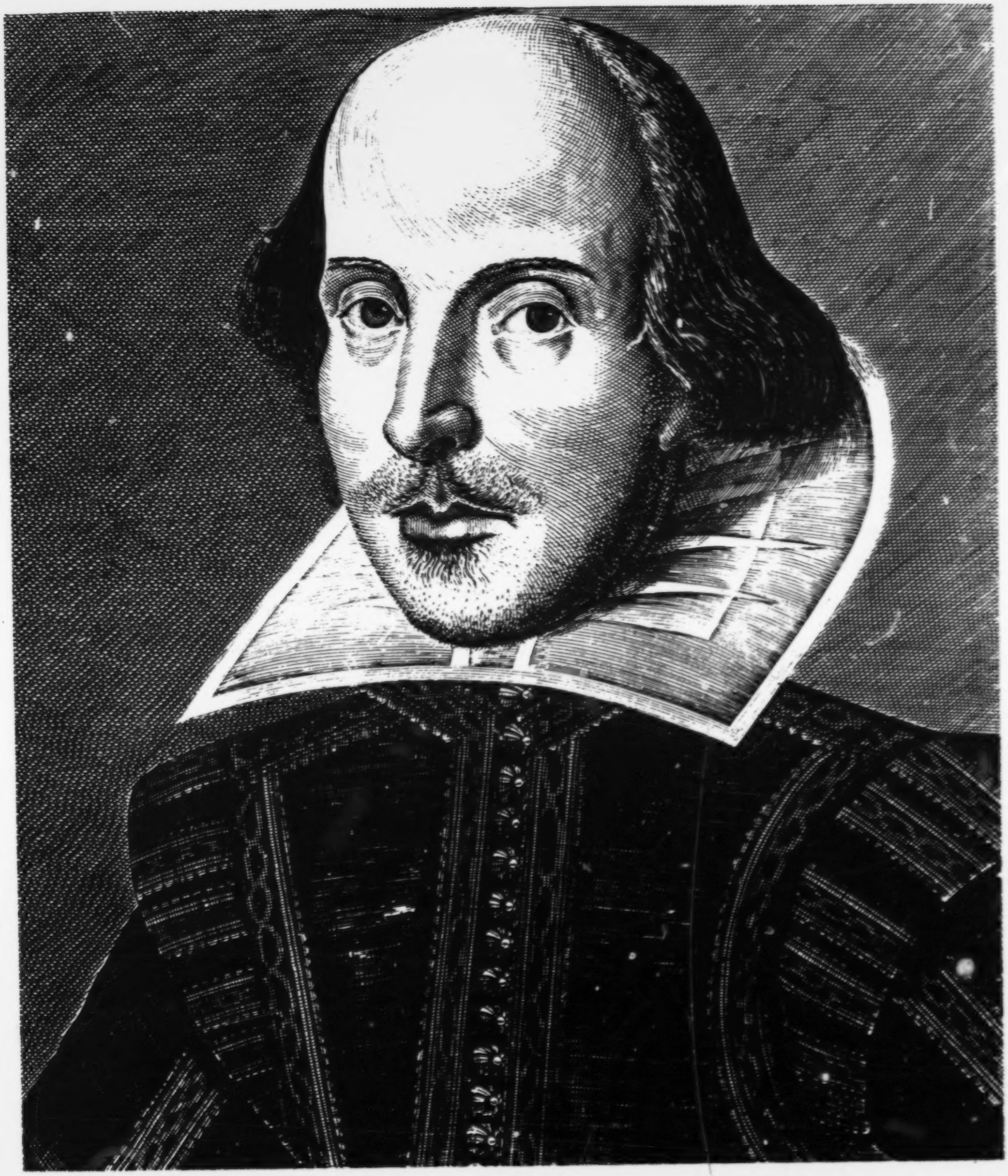
What writers do is a lot more self-evident than how they do it. Feed a milch cow hay and she'll give milk. Let writers gather information and they'll produce books and articles. But the steps in the transformation of hay intomilk are orderly and, thanks to modern biology, understandable. The steps in the production of articles are not.

Writers start by selecting or being assigned a topic; they then gather information on the topic through personal observation, library research, and interviews; they select from the information gathered and organize the selections; and finally they find words that will convey the information to the reader with the desired effect. Of course, this description of what writers do is much too neat. In reality the information gathered may cause the writer to change the topic; phrases, sentences, or paragraphs that appear in the final version of the piece might occur to the writer as soon as a topic suggests itself; and bits of information might still be sought after up till the moment of publication.

Editors frequently do some writing and almost always do much rewriting, but their primary duties are to plan the contents of the publication and to supervise its preparation. They decide what will appeal to readers, assign topics to writers, and oversee the production of the book, magazine, or newspaper. In small organizations, one editor has full responsibility for the publication. In larger ones, an executive editor oversees the activities of associate or assistant editors who have responsibility for particular subjects, such as fiction, international news, or sports. Administrative duties of editors include hiring and firing writers and other employees, planning budgets, negotiating contracts with printers and freelance writers, and general managerial duties. In broadcasting companies, program directors have responsibilities comparable to those of editors.

Editors and program directors are often helped by assistants who may have the title of assistant editor, editorial assistant, copy editor, or production assistant. Many of these assistants hold entry-level jobs. They review copy for errors in grammar, punctuation, and spelling. They check manuscripts have the title of assistant editor, editorial assistant, copy editor, or production assistant. Many of these assistants hold entry-level jobs. They review copy for errors in grammar, punctuation, and spelling. They check manuscripts for readability, style, and agreement with editorial policy. They add and rearrange sentences to improve clarity or delete incorrect and unnecessary

Shirley Rudney is a labor economist in the Division of Occupational Outlook, BLS.



By permission of the Folger Shakespeare Library.

Usually one editor works with many writers, but Shakespeare was one writer who supplied work for many editors.

JOB FINDING AND
A COURSE

by Todd

Students may not be able to learn at school all the skills they'll need on a job, but they can learn the skills they'll need to land a job. They can also learn how to find out which job they want to land. A class in Job Finding and Career Planning can teach students how to get a job, how to keep it, and how to select a career. Studies show that students who take such a course have a better chance of being hired than do students who don't; they also have a much better idea of how they want to make a living. As a bonus, once students focus on a career, they sometimes see the relevance of their other classwork to their future and improve their attitude towards school.

Ted Friel of Carkhuff Associates and I developed a course on Preparing for Work over the past few years. It has been taught to many different kinds of students, including inner-city and suburban high school students and prisoners in several States. It can be—and has been—adapted to fit into a standard class schedule both as a course in its own right and as a component of other courses. It can also be presented as an extracurricular activity, but this has proven to be less successful.

Todd Holder is an administrator in the Genesee Intermediate School District, Flint, Michigan.

The course has three major divisions: Employability skills, coping skills, and career selection skills. If 30 classroom hours are devoted to the course, the first part takes 5, the second 12, and the third 9. The topics for each hour's work are given in the accompanying box, "Preparing for Work in 30 Hours." The last 4 hours of the course are devoted to learning from people, learning from programs, involving parents, and verifying the career plan.

Employability Skills

The skills that make a person employable are not so much the ones needed on the job as the ones needed to get the job, skills like the ability to find a job opening, complete an application, prepare a résumé, and survive an interview. *GETAJOB,* by R. R. Carkhuff and others, is a rich source of information on these skills; many of its suggestions are followed here.

Finding a job begins with finding a job opening. Students will end up with a long list of job openings to check out if they touch bases with all the people, organizations, and books that can lead them to employers.

Surveys of Michigan's high school graduates indicate that family members and friends are far and away the most common source of leads to job openings. When students realize this, they see the need for letting anybody and everybody know that they are looking for a particular type of work.

In addition to friends and family members, certain agencies can be consulted for information about job openings. The Job Service, a State agency, disseminates information daily on a wide variety of jobs and can, under the right conditions, be a useful service for students to explore. In like manner, private employment agencies are often helpful, although they might be best after other sources have been exhausted because of the service charge assessed against the user. Checking postings at places where the student would like to work and at union halls can sometimes lead to an opening. Very often, community and 4-year colleges have bulletin boards with job openings posted for which high school students can qualify. Similarly, some high schools have placement offices where job information can be acquired.

Written materials can also lead to jobs. A nearly complete list of local businesses, listed in alphabetical order according to the type of product or service offered, is found in the Yellow Pages. It is commonly known, also, that local newspapers carry a list of varied job openings. A source not so

CAREER PLANNING:

OUTLINE

Holder

Preparing for Work in 30 Hours

Content Area:	Skills:	Hours of Training:
Employability Skills	1. Finding Job Openings 2. Presenting Self on Paper 3. Presenting Self in Interview	5 hours
Coping Skills	1. Being Prepared 2. Being Polite 3. Paying Attention 4. Accepting Criticism 5. Asking Questions 6. Making Choices 7. Offering Criticism 8. Staying Out of Trouble 9. Starting a Conversation 10. Continuing a Conversation 11. Completing Tasks 12. Following Directions	12 hours
Decision Making Skills	1. Expanding Career Options 2. Identifying Values 3. Developing Matrix and Scoring 4. Selecting Career Goal(s)	4 hours
Career Planning Skills	1. Reviewing Employability, Coping, and Decision Making Skills 2. Selecting Sequential Educational Experiences 3. Selecting Sequential Work Experiences 4. Developing Career Plan	5 hours
Learning Program	1. Learning from People 2. Learning from Programs	2 hours
Counselor Program	1. Enlist Parental Involvement 2. Verify Career Plan	2 hours

well known, however, is the reference section of the library. It will have manufacturers' directories and service directories for the whole country and for the State in which it is located. City directories may also be available. In many of these directories, all the businesses in a locale are grouped according to their products and then listed alphabetically. Pertinent information about the company is given, including the address, name of the person in charge, and the number of employees. For many industries, there are specialized reference books. *The Red Book on Hotels and Motels* is an example of a guide that would be useful to applicants interested in cooking, hotel management, and cleaning occupations. *The Directory of References* provides a guide to the more specialized books.

The second major employability skill for the class to work on is "Presenting Self on Paper." Like most things that employers are involved in, hiring new employees means paperwork. The question the employer wants answered is "How can the manner in which applicants fill out my standard forms and present their backgrounds on paper show me which ones will become productive workers?" For the applicant, the question is "How can I convince an employer with the papers I prepare that I am the best applicant?" The papers

U.S. Department of Labor
Bureau of Labor Statistics
Washington, D.C. 20212

Official Business
Penalty for Private Use, $300.

Postage and Fees Paid
U.S. Department of Labor
Lab-441

SECOND CLASS MAIL

000 SERIA300SAISSDUE003R 1
SERIALS PROCESSING
UNIVERSITY MICROFILMS INTL
300 N ZEEB RD
ANN ARBOR MI 48106

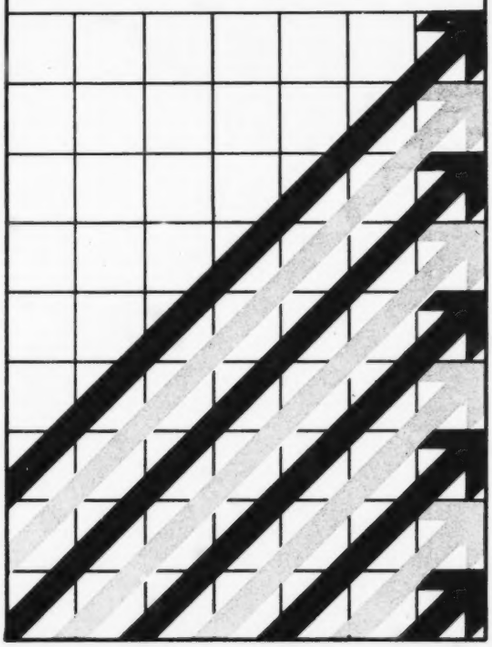
lish an imperfect record, but tend to show that the projections have been reasonably accurate in the majority of cases. The most recent evaluation examined the industry-occupation matrix projections for the 1960–75 period that were prepared in the late 1960's.[2] This study pointed out that the unforeseen economic downturn of the mid-1970's reduc the accuracy of the occupational projections, although the impact was not as great as one would have expected. The projections presumed an unemployment rate of 3 percent in 1975, but the target year turned out to be the trough of the recession, and the actual unemployment rate was 8.5 percent. Consequently, employment in occupations that are sensitive to economic cycles such as craft and operative occupations, generally were overprojected. Employment in these two groups had been growing and almost reached projected levels by 1974, but turned down as economic conditions worsened in 1975. Underprojections, did occur in 3 of the 9 major occupational groups despite the recession, and these errors might have been somewhat higher if economic conditions in 1975 had been as favorable as assumed.

The difference between projected and actual employment for the major occupational groups ranged from a 6.7-percent underestimate of clerical workers to a 9.1-percent overestimate of operatives. The average of the absolution percentage differences was 6.1 percent.

The direction of employment change between 1960 and 1975 was correctly anticipated for all of the nine major occupational groups, although employment in five was over projected. Estimates for white-collar groups generally were closer to the mark than those for blue-collar groups—reflecting the distortions in occupational patterns resulting from the 1973–75 recession.

Differences between projected and actual employment in the 76 detailed occupations for which projections could be evaluated ranged from -43 percent for personnel and labor relations workers to +136 percent for plasterers. The absolute percentage errors for all 76 occupations averaged 20.8 percent. Two-thirds of the occupations however, had errors lower than the average. Differences between projected and actual employment tended to increase as the size of the occupation diminished. The availability of more reliable historical data for larger occupations could be expected to improve projected accuracy. The greater accuracy of projections for the occupational groups, however, also reflects the compensating effect of aggregation, because most group totals were obtained by summing projections for detailed occupations. In addition to being weak for small occupations, the projections were relatively inaccurate for occupations that declined in employment or grew very rapidly.

"The direction of employment change between 1960 and 1975 was correctly anticipated for all nine major occupational groups, although employment in five was over projected."



The direction of employment change between 1960 and 1975 was correctly anticipated for 64 of the 76 detailed occupations. Again, results were best in the larger fields of employment. Moreover, only 4 of 51 occupations with more than 50,000 workers in 1960 had projections that were in the wrong direction, while 8 of the 25 smaller fields had that mistake. Some of the differences, however, between projected increases and actual declines, or vice versa, were relatively small.

Employment grew in 60 of the detailed occupations between 1960 and 1975, and declined in the remaining 16. Increases were estimated more accurately than decreases. Projections for growing occupations averaged an absolute 17 percent off actual employment, while those for occupations with loses averaged 35 percent off. Projections of growth were closely divided between underestimates and overestimates of reported employment gains. Almost all employment declines were underestimates.

The direction of employment change was correctly anticipated for all but one of the growing occupations. The number of sailors and deckhands increased by about 1 percent instead of declining by 16 percent as projected.

Occupations at either end of the employment growth spectrum generally had less accurate projections than those in the middle. Occupations with the most rapid growth had the largest projection errors, and the slowest growth occupations had somewhat larger errors than those with moderate growth.

Target year employment usually was underestimated in the fastest growth occupations and overestimated in those with the slowest growth. Projections were lower than actual levels in 14 of the 15 fastest growth occupations, and higher than actual in 12 of the 15 with the slowest increase.

Decreases were not anticipated in 11 of the 16 occupations that declined in employment; plasterers, patternmakers, telephone operators, power station operators, machinists, and railroad engineers and brake and switch operators. The projections correctly identified postmaster, weaver, knitter, and locomotive engineers helpers as occupations which would decline in

[2] Max L. Carey, "Evaluating the 1975 Projections of Occupational Employment," *Monthly Labor Review*, June 1980, pp. 10–21.

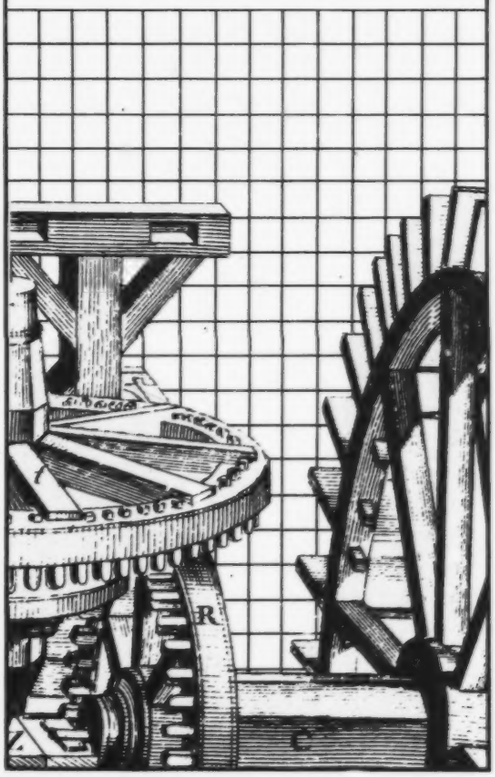
employment, although the rate of decrease was underestimated for three of these four.

The failure to anticipate the impact of technological change and other factors that affect occupational needs also contributed to errors. In projecting employment of knitters, for example, it was assumed that increases in the demand for knit goods would more than offset the employment affect of laborsaving technology. Although total employment in the knitting industry grew even more than projected, employment in this occupation declined as a result of larger capacity, higher speed machinery, and other technological developments. Misassessments of the effect of technological developments also contributed to overprojected demand for plasterers, weavers, telephone operators, and several railroad occupations. In most cases, the laborsaving technology had been identified, but its future impact was difficult to project accurately because data were either insufficient or nonexistent.

Accuracy Required by Different Users

What is the meaning of the word "accuracy" in the context of occupational projections? How much inaccuracy is tolerable? And, does the accuracy required of projections vary depending on the specific purpose for which they are to be used? BLS analysts believe it is impossible to predict future levels of occupational employment with total accuracy. The key criterion, therefore, in evaluating the accuracy of the projections should be: Would decisions relating to career choice or education planning differ if the projections were more accurate?

"The failure to anticipate the impact of technological change and other factors that affect occupational needs contributed to errors."



To address the questions raised above, let's look at an illustrative example: An occupation having employment of 50,000 in the base year is projected to grow to 85,000 workers—or by 70 percent. If actual employment in the target year was 76,000, the projection would have fallen short of the mark by 10 percent. Looking at the guidelines on how employment growth is described in the *Occupational Outlook Handbook* (refer to figure 1), the actual level would still be in the "much faster than average" range, and we could conclude from this that the reader was given an accurate assessment. If actual employment was 68,000—or 20 percent understated, the actual growth rate would fall into the middle of the "faster than average" range. Any occupation falling into this growth category, however, would still—on average, baring any other information on supply-demand—be expected to offer favorable job prospects and the decisions regarding career choice in either case would probably have been identical. Thus because of the way the information relating to occupational growth is phrased in the *Handbook,* occupational employment projections reflecting faster than average growth would, in most cases, have to fall considerably off the mark before you could reasonably conclude that the user was grossly misinformed. The *Handbook* guidelines governing how projected employment change below the faster than average range are more narrow, and therefore can accomodate a lesser amount of error or imprecision in the projections.

The descriptions of employment outlook in the *Handbook* do not contain any numbers. Because many users—particularly planners of education and training programs—have a need for the detailed statistics that underlie the makeup of job outlook information, the Bureau makes available a variety of data in a number of publications. "The Job Outlook in Brief," for example, besides giving a summary of occupational employment prospects, presents figures on the size of occupations and estimated annual openings that are expected due to growth and replacement needs.[3]

Figure I. **Guidelines used for 1980-81 Occupational Outlook Handbook to describe employment growth**

Growth description	*Projected 1978-90 change in employment requirements*
Much faster than the average for all occupations	50.0 percent or more
Faster than the average for all occupations	25.0 to 49.0 percent
About as fast as the average for all occupations	15.0 to 24.9 percent
More slowly than the average for all occupations	5.0 to 14.9 percent
Little change is expected	4.9 to —4.9 percent
Expected to decline	—5.0 percent or more

[1] The average increase projected for all occupations for 1978-90 was 20.8 percent.

[3] The most recent "Brief," which can be found in the Spring 1980 *Occupational Outlook Quarterly,* is directed at young people making career decisions and at counselors and others who provide guidance to them.

the clinical experience is structured just as it was in the school Dave read about; but at West State, Pat will study the nurse and the individual, the nurse and the family, and the nurse and the community, a sequence also followed in some diploma and A.D. programs. All of Pat's courses will put more stress on theory than Nightingale; and, although the B.S.N. will take longer to earn, Pat will not spend as much time with patients as Dave will. At graduation, Pat will have taken 120 semester hours of courses, not quite half in nursing and the rest in the physical and biological sciences, the social sciences, and the humanities. Because the nursing courses will require her to spend hours at a time in the hospital during her last 2 years, her schedule will differ from that of most college students; but at least in the first 2 years, it will be much like theirs. And, when she graduates, she will have a wider choise of careers than graduates of other programs.

Nursing the Ill

Althea Thompson, a widow with two young children, decided to become a nurse because relieving pain was important to her. She had several reasons for chosing to enter nursing through her local community college, the route most often taken by nursing students these days. The A.D. program at Springdale would prepare her for the career she wanted as a staff nurse. Also, she wouldn't have to pull up her roots in order to go to Springdale—since the school is in her city—and the tuition is low. She'll also be earning a paycheck sooner than if she entered most diploma or B.S.N. programs, and, if her finances run too low, she can get a job and still attend school part time. (Some B.S.N. programs accept part-time students, but, naturally, part-time attendance delays completion even further.) About the only drawbacks for Althea are that the program will take more than 2 years to complete because she'll have to fulfill some science requirements before beginning it and that she'll take both nursing and general education courses at the same time. To Althea, the community college program seemed almost tailor made for an older person, such as herself, who already has wide experience in the world. In fact, few of her fellow students at Springdale will be recent high school graduates; many advisors encourage such people to enter the other programs if at all possible.

At Springdale, Althea will take fewer courses than either Dave or Pat. She will study many of the same subjects—chemistry, nutrition, anatomy, English composition, and such—but, while Dave and Pat will take 6 semester hours, she will take only 3. Her program will not simply be the equivalent of the first couple of years of their's. It will be especially designed as a whole in itself.

At most associate degree schools, the content of the nursing courses is arranged along the same lines as the program at West State or the program Dave read about, although both theory and clinical experiences are reduced. But at Springdale, still a third approach is taken, one that can also be found at some B.S.N. and diploma schools. The content of the nursing courses at Springdale is based on the

frequency of particular health problems—not necessarily diseases—in the United States. The courses deal with the role of the nurse in relation to childbearing and infant care, accidents, venereal diseases, drug and alcohol dependence, cardio-renal-pulmonary dysfunctions, neoplasms, degenerative disorders, diabetes mellitus, mental illness, chronic diseases, and aging. Althea's clinical experiences, which she will perform at various hospitals, clinics, and nursing homes in the city, will be structured so that she learns the nurse's role in dealing with each of these problems. Upon graduation, she'll be able to work as a staff nurse. Compared with graduates of other programs, she'll be less likely to become a supervisor—unless she returns to school. But she doesn't want to be a supervisor. She wants to give direct care to the patient, and she wants to do it as soon as possible.

The Questions They Asked

More than 1,300 different programs now prepare people to become R.N.'s. As a result, there is enormous variety, and students can be pretty sure of finding programs especially well suited to their needs. To do so, students who are looking for a program to enter should ask many questions. Some are easily answered; others require research in the library and the advice of counselors, family members, and working nurses. Among the questions that should be asked by every potential nursing student are the following:

- What kind of nursing career do I want?
- What kinds of educational programs are available in my area?
- How much money does the education cost?
- Can I get financial aid?
- Will I be able to work while attending school?
- Can I go to school full time or do I need a part-time program?
- How long is the program?
- Will I have to meet prerequisites before beginning the program?
- How much clinical experience do I want?
- Where does the clinical-experience take place? At the school or elsewhere?
- How much theory, science founda-

material. Editorial assistants also perform research for writers and verify facts, dates, and statistics. They may help prepare material for publication or broadcast by arranging page layouts of articles, photographs, and advertising or by planning the use of films. They may also compose headlines, prepare copy for typesetters, and proofread the printer's galleys. Some editorial assistants read and evaluate manuscripts submitted by freelance writers or answer letters about published or broadcast material. Production assistants clip stories that come over the wire services' printers, answer phones, and make copies of material for newswriters, editors and program directors.

Working conditions for writers and editors vary with the kind of publication they work on and the kind of articles they produce. They spend most of their time alone, although the places they spend it in can range from a comfortable, private office to a large room filled with colleagues typing away and tracking down information over the telephone. The search for information causes some writers to put in long hours at the ball park or theater, but most have to be content with the library.

The workweek usually runs 35 to 40 hours. Night and weekend work is required, however, of those who prepare morning or weekend publications and broadcasts. Some workers must also put in overtime to meet deadlines or to cover a late-developing story. The more frequently the publication is issued, the more frequent the deadlines and the greater the pressure to meet them.

How Many and for Whom

People who fly planes for a living are almost all called pilots, but many who live by putting words on paper are not called writers. For example, this magazine employs both writers and economists; the economists differ from the writers more in academic background than in current job duties. For this reason, it is difficult to estimate how many people work as writers. However, in 1978, about 100,000 people earned salaries as writers or editors, according to a Bureau of Labor Statistics survey. This figure excludes two large groups of writers: Newspaper reporters—who numbered about (50,000) and are separately classified—and self-employed, freelance writers, who sell their work piecemeal or work on short-term contracts. (See box.)

Writers work for newsletters, magazines, book publishers, advertisers, public relations firms, manufacturers who need technical manuals, television broadcasters who need news stories, and even movie producers who need scripts. In 1979, there were about 1,700 daily newspapers; between 6,000 and 7,000 weeklies; about 4,800 magazines; about 3,800 newsletters and house organs—publications aimed at the employees of particular organizations or the members of an association; over 8,000 radio stations; and about 1,000 TV stations.

Persons who write and edit for major book publishers, magazines, broadcasting companies, and advertising agencies tend to be concentrated in large cities like New York, Chicago, Los Angeles, Boston, Philadelphia, San Francisco, and Washington, D.C. More widely dispersed throughout the country, on the other hand, are those who work for newspapers; house organs; professional, religious, business, technical, and trade union magazines or journals.

Write without pay until somebody offers pay. If nobody offers within three years, the candidate may look upon this circumstance with the most implicit confidence as the sign that sawing wood is what he was intended for.

MARK TWAIN

Qualifications and Advancement

Writers and editors should be able to express ideas clearly and logically, so they should be masters of the language. Creativity, intellectual curiosity, a broad range of knowledge, self-motivation, and perseverance are also valuable assets. For some jobs, the ability to concentrate amid confusion and to produce under pressure are essential. Since writing requires research, writers must be familiar with research techniques. Editors must have good judgment in deciding what material to accept and what to reject. They must also have tact and the ability to guide and encourage others in their work.

No fixed route leads to employment for writers and editors. A college degree is required by many employers, but there is little agreement as to the preferred major. Some employers look for a broad liberal arts background or a major in literature, history, philosophy, or one of the social sciences. Others prefer to hire people with degrees in communications or journalism. Some jobs, such as technical writing, require a degree in a specialized field—engineering, business, or one of the sciences, for example.

All prospective writers need practical writing experience. High school and college newspapers, literary magazines, small community newspapers, and radio stations all provide valuable—but usually unpaid—experience. Many magazines, newspapers, and radio and TV stations have summer internships in which students can learn about the publishing and broadcasting business. Interns might run errands, answer phones, conduct some research and interviews, or even write short pieces, depending on the employer.

Advancement for writers and editors depends in part on the size of the organization they work for. In small firms, beginning writers and editors may do a little bit of everything, not only working as editorial or production assistants but also writing or editing material right away. They often advance by moving to other firms, so turnover among beginning writers and editors is high. In larger firms, jobs are usually structured more formally. Persons in entry-level positions generally do research, fact checking, or copy editing. They take on full-scale writing or editing duties less rapidly than do the employees of small companies. Advancement comes as they are assigned more important articles to write or edit.

Earnings

In 1979, beginning salaries for writers and editorial assistants ranged from $10,000 to $15,000 annually, according to the limited information available. Salaries for experienced writers and researchers averaged between $18,000 and $25,000. Salaries for radio and TV

news reporters and news editors in the less populated areas of the country ranged from about $9,000 to $11,000 a year; network news writers averaged about $25,000 a year. Writers and researchers on magazines with a large circulation had annual salaries of about $22,000. Advertising writers with 3 to 4 years' experience averaged from $18,000 to $22,000 a year. Writers and editors employed by the Federal government earned an average of $22,000 a year as of September 1979.

Editors generally earn more than writers, with salaries ranging from about $11,000 to $15,000 on small publications; senior editors on large circulation newspapers and magazines earn over $50,000 per year.

Outlook

Each year, hundreds of young people with college degrees in English, journalism, communications, and the liberal arts flock to New York and other publishing centers seeking the excitement associated with some writing and editing jobs. Many never find it. They end up in other occupations because the number of people qualified to work as writers and editors greatly exceeds the number of positions available, despite the high turnover in these occupations. Throughout the 1980's, the outlook for writing and editing jobs is expected to continue to be keenly competitive.

Growth in the employment of writers and editors will largely depend on the growth of the industries that employ most of these workers. In 1978, more than one-third of the salaried writers and editors worked for newspapers, periodicals, and book publishers. Overall, employment in these industries is expected to increase about as fast as the average for all industries through the 1980's. (In other words, employment in these industries is expected to be 15 to 24.9 percent higher in 1990 than it was in 1978.) Developments in printing technology and the use of computerized word-processing equipment are having a great effect on these industries, but the new equipment will not replace the need for writers and editors.

Nonprofit organizations—including research agencies and religious, business, professional, and civic associations—employed more than 11,000 writers and editors in 1978. Between 1978 and 1990, employment in this group of industries is expected to increase faster than the average for all industries since these organizations provide professional services that will be more in demand during the next decade.

Employment in radio and television broadcasting, which employed 4,000 writers and editors in 1978, is expected to increase much faster than the average through the 1980's. In the past decade, there has been a huge upsurge in the number of FM radio and educational TV stations. In the future, increased use of cable television and of television sets that receive news directly from servicing companies may have an important impact on the employment of writers and editors.

Technical writers and editors, who are usually trained in the subject they deal with, are expected to be in increasing demand during the 1980's because advances in science and technology will continue to require writers who can put technical and scientific information into simple, clear language that can be understood by managerial, sales, and service employees, as well as by the general public. For some years, competition for these positions has been less keen than the competition for writing and editing jobs in general.

Persons considering careers in writing and editing should keep their options open because of the competitive job market in this field. People prepared to become writers can work as newspaper reporters, information specialists, or, in some cases, teachers. However, these occupations also are very competitive at the present time. Academic preparation or work experience in a field unrelated to writing may prove useful to some people either in order to qualify them as writers specializing in that field or to qualify them for a job in the field itself.

Have Pen, Will Travel

Freelance writers sell their works one by one instead of working for a salary. Sometimes they write something and look for a buyer, but most often they contact a publisher, find out what kinds of material are needed, and write that kind of article for an agreed upon fee. According to *Writer's Digest*, at least 175,000 persons sell material on a freelance basis. Magazines and other publishers have increased the amount of freelance material they use recently, but freelancing is, if anything, even more competitive than the salaried job market for writers.

Few freelance writers generate a regular demand for their work and support themselves by their writing alone. For example, according to *Writer's Digest*, only about 26 novelists make a living writing; the rest hold other jobs. The majority of freelance writers do not write full time. Often, they make their living in other occupations and write as a hobby.

The earnings of freelance writers naturally depend on how much is sold although a well-known writer might command a higher fee than a neophyte for a piece of similar length. Magazine articles are usually paid for when they are published or when they are accepted for publication. Fees range from $100 for a 500-word article by an unknown writer to several thousand dollars for a feature length peice by a famous author. Books might be paid for in the same way, but more often the writer receives a royalty, a certain percentage of the selling price of each copy of the book. Royalties ranging from 5 to 15 percent are most common. A successful book can earn a writer thousands of dollars. Most books are not successful.

Editors, too, work on a freelance basis. Again, according to *Writer's Digest*, they typically work for publishing firms in New York or for magazines that have small staffs.

to be prepared are application forms and résumés.

In regard to filling out applications properly, several principles can be stressed. Based on the expectations of the average employer, applications are better received when they are filled out in black ink, have no erasures, and have all the blanks filled in. Students are advised to be ready with the information usually requested on applicant forms, including the names and addresses of three reliable references. Having such information written down saves time when going from employer to employer to file forms.

A résumé gives students a chance to show an employer that they are well prepared for work and qualified for a job. It can create a favorable impression for the students before the employer even sees them. Contrarily, a sloppy, poorly designed résumé might cause an employer to overlook an applicant who is actually suited to the job that's available.

GETAJOB suggests that developing a résumé has five stages: identifying a career goal, identifying relevant experience, describing specific skills, highlighting strengths, and composing the 1-page résumé itself. The identification of the career goal can be made in a single phrase that links an occupation with an employer. For example, it might be to work as salesperson in a florist shop. Naturally, students must have some idea of what their career goal is before they can write such a statement or, indeed, prepare a résumé.

The experience that students have acquired will vary greatly. Some will have a lot, others will need help in thinking of any. In all cases, however, the students should be guided to arrange their experience in ways that show its relevance to the job they seek. For each experience, the students are then asked to identify the skills learned through the experience, skills suitable to the job desired. The purpose of this is to demonstrate to the employer that the student already has some skills related to the job and that the student is capable of learning in general. The students themselves also benefit at this stage. Very often they are not aware that they have as much "know how" as they do until they begin listing their skills on paper.

Probably the aspect of an effective résumé that is most often ignored is the highlighting of the person's strengths through quantitative descriptions. This means that students should describe their experience in quantitative terms. An example is stating "Sold $5,000 worth of merchandise in 3 months." Applicants single themselves out by using this technique. The numbers give the potential employer a much more precise idea of the applicants' accomplishments than does a general description of job duties. Employers are always searching for outstanding workers, and quantitative statements are one way in which applicants can show that they are outstanding.

Before composing the résumé itself, students use work sheets to assemble all the information that may be relevant to the job they are seeking. Using the work sheets insures that nothing important will be omitted from the final draft. They also make it easier for students to see the ways in which different arrangements of the same information can be suitable for different jobs.

The results of an interview are often determined within the first 5 minutes. For this reason, it is important that students be tutored in ways to make a good first impression. As with the résumé, *GETAJOB* offers many useful suggestions. It specifies five points that should be impressed upon the students: dress and groom appropriately, greet the interviewer, attend to the interviewer, listen to the interviewer, and answer questions.

Many jobs are lost to young people at the time of the interview because they did not know how to dress and groom in a manner that was acceptable to the employer. Although the actual teaching of this skill can take a considerable amount of time because of the sensitivity young people show in relation to current trends in dress and grooming, only two basic principles need be presented: Be neat and clean; and dress in a manner in which the employer can see you as one of the company's employees. The latter principle usually translates into dressing as the workers do who are in the job being sought; but sometimes the dress for the interview should be somewhat less casual than that worn every day by the workers. Usually, this means that suits and dresses are appropriate, although at times other attire is acceptable. It must be stressed continually that the students are dealing with the employer's frame of reference, not their own. The employer makes the choice of whom to hire.

Students are taught that a proper greeting consists of six parts: Looking the employer in the eye; shaking hands; saying the employer's name; introducing oneself; giving the reason for coming; and waiting to be seated. For example, a student might say: "Mrs. Sanchez, my name is George Doit, and I have come to be interviewed for the computer operator position." This skill lends itself well to role playing by the students, which they tend to enjoy.

By attending to the interviewer, *GETAJOB* means assuming a posture that shows the interviewer that the applicant is willing and eager to listen. By squaring off or facing the interviewer, the applicant shows interest, which is also shown when the applicant sits up straight or leans slightly toward the interviewer. Students are also coached to sit close to the interviewer (from 3 to 5 feet away) in order to eliminate any distractions that might interfere with communication. They are told to move a chair closer to the interviewer's desk if the chair is too far away.

Employers, by the nature of their positions, have to be teachers. Employees, in turn, have to be learners if they are to be successful. An employer can be assured that the pro-

spective employee is able to listen well if the applicant repeats the basic content of the employer's statements during the interview. This technique can be overdone, but if used selectively—such as when the interviewer explains the duties of the job being filled—it can be very effective.

Since a large part of any interview involves answering questions, students should prepare some responses. Being aware of the standard questions and developing effective answers is a beginning. When preparing answers, students will benefit from the work that went into their résumés, for they will be able to see the relationship between their experience and particular jobs. And in the actual interview, they will be able to refer to specific events in their work history that show their ability to do the job under consideration.

Coping Skills

Once people find a job, they face the problem of keeping it. The skills that enable people to work with each other and manage themselves are the coping skills. They are used in all work settings. It is often acknowledged that the use of coping skills contributes much to success on a job, but little work has been done to identify and teach these skills.

R. R. Carkhuff and his associates have developed a list of 12 skills that lead to success on the job and designed training modules to teach each of them. The modules have been tested with students in the Genesee Intermediate School district. The coping skills identified are being prepared, being polite, making decisions, following directions, completeing tasks, staying out of trouble, starting conversations, asking questions, accepting criticism, giving advice, and paying attention. In each module, the instructor defines the skill and explains its relevance. Students are then shown a demonstration of the skill and engage in role playing to practice it themselves. Once a skill is acquired, the students discuss ways to use it both in school and at work.

Career Planning

Career planing has two phases, making a decision about which career to pursue and selecting a path to follow that leads to that career.

There are a number of models for career decisionmaking. For this course, the Carkhuff model was selected. *The Art of Developing a Career: A Helper's Guide* and *The Art of Developing a Career*, both by T. W. Friel and R. R. Carkhuff, served as training materials. We found that using this model, the students could be taught how to make systematic decisions about their careers in about 4 hours of class time.

The ability of many young people to make decisions about their career is limited by the simple fact that they are not aware of enough of the options available to them. Once students have been introduced to the abundant material available on careers and occupations, they are prepared to follow a procedure for choosing a career.

The goal of career decisionmaking is to select a career route that will satisfy the student. To determine this, the components of a job that appeal to the student must be identified. We use the term *values* to describe the components that a student considers important. Typical values are salary, vacation time, and work hours. In order for the students to reduce decisionmaking to quantitative terms, each value has to be measured against two different scales. The first scale is assigned by the student, who simply gives each value a weight ranging from 1 to 10. The second scale, which we call the "Favorability scale," is more complicated. It attempts to show how successful a particular occupation is in fulfilling a certain value. The scale is the same for all occupations, although, naturally, the places held by different occupations vary. The favorability scale for each value is provided by the teacher, but the student must learn where each occupation of interest falls on it. The occupation's rank on the favorability scale is used as a multiplier for the weight assigned by the student to the value. All the favorability scales have five degrees, from + + to --. If an occupation is high in a given value, it scores a + +, and the weight assigned it by the student is multiplied by 2. A score of + translates into a multiplier of 1; +- is 0; - is -1; and -- is -2. Thus, if an occupation's vacation time warrants a + + and if a student assigns a weight of 5 to this value, the occupation will have a score of 10 for it. The student then adds up the scores of all the values for each occupation of interest. The occupation with the highest total should promise the most job satisfactions to the student.

The career decision making exercise is not meant to determine hard and fast decisions but to guide the decisionmaker toward a continuous series of career choices throughout life.

The second part of the career planning phase of the training is to leave all the students with plans by which they can achieve their career goals. In other words, it outlines the education and experience that the students will acquire before entering upon their careers. For a high school student, it would indicate the courses to take and the work experience to seek both in high school and after graduation. From someone already out of school, it might indicate possible training programs or a sequence of jobs that will ultimately lead to the career goal. The ideal is to have training and work experience go hand in hand once the student has developed a career plan. At this point, it is also possible to involve the parents in the students' plans.

At the end of the course, students have a practical plan in hand by which they can reach a career goal that they have chosen for themselves. As a result, they tend to become more encouraged about their future and proud to have determined it for themselves.

Projections

Additional occupational outlook data—including statistics on growth rates, projected employment requirements, and available data on completions of related training programs—are provided in *Occupational Projections and Training Data.*[4] In addition, the National Industry-Occupational Employment Matrix, itself, is available.[5]

These items provide employment outlook information in a format that allows users to rank or compare related occupations by considering such factors as employment change, size, and job openings. This information is stated categorically—that is, a given occupation will grow from *a* to *b,* or by a certain percent between the base and target year; and total job openings during the projection period are expected to equal *x,* the sum of *y* for employment and *z* for replacement needs. This format enables education and training planners, for example, to compare the projections of annual average job openings with current training statistics to determine whether training efforts should be expanded or contracted. Inaccuracy in the projections, however, takes on greater significance when projections are put to these kinds of uses—particularly if users over rely on statistics in the decisionmaking process. Users should understand that the projections represent the Bureau's best judgment but are dependent on the realization of the assumptions on which they are based.

Improving the Reliability of Projections

Inaccurate base-year data, methods, and assumptions contribute to inaccurate projections. To identify areas where improvements can be made, the Bureau periodically evaluates the accuracy of its projections of economic growth and industry and occupational employment.[6] The results of these evaluations also are published in order to alert users to the limitations of projections as well as to their sensitivity to various factors including cyclical fluctuations in the economy.

"Work is underway to develop occupational projections based on two versions (alternatives) of what the economy might look like in 1990."

The evaluation of the 1975 projections, cited earlier, found that the projected occupational staffing patterns (industry-occupation ratios) were a greater source of error than the estimates of industry employment levels. The estimates of staffing patterns were based on scanty data for trends in the occupational structure of industries.[7] Although the projections were made in the late 1960's, the only comprehensive sources of historical data on ratios were the 1950 and 1960 decennial censuses. A long recognized need for current, detailed data on industry staffing patterns prompted the initiation of a cooperative Federal-State program in 1970 for surveying occupational employment. Data on employment by industry is now collected in 3-year cycles for more than 2,000 occupations. These improved data will form the basis for development of 1980–90 occupational staffing patterns by industry for use in the 1982–83 *Occupational Outlook Handbook* and various publications tied to it.

The Bureau's projections models cannot anticipate cyclical or short-term fluctuations in the economy, but should one occur in a target year—as happened in 1975—the accuracy of the projections are reduced. Work is underway to develop occupational projections based on two versions (alternatives) of what the economy might look like in 1990. These would form a range around which a hypothetical "best-guess" projection could be expected to fall. The Bureau also is planning to explore with its model how the impact of the business cycle might affect employment in those sectors of the economy that have exhibited past sensitivity to cyclical fluctuations. This alternative or cycle projection would not attempt to forecast the timing, depth, or even the occurence of the next recession but rather measure the impact of cycles on the distribution of output and employment. If the results of this research effort are satisfactory, future occupational outlook materials will more specifically address the sensitivity of occupations to cyclical swings in the economy.

Occupations incorrectly projected are, in many cases, those for which employment data were sketchy or those for which the employment trend changed direction. Changes in direction are frequently caused by changes in consumer preferences. The popularity of longer hair for men in the 1970's, for example, resulted in a decline in employment of barbers. Anticipating such shifts in employment trends is obviously difficult. To reduce the probability for error, BLS revises its projections every 2 years. Only the most recent projections should be used for planning and counseling.

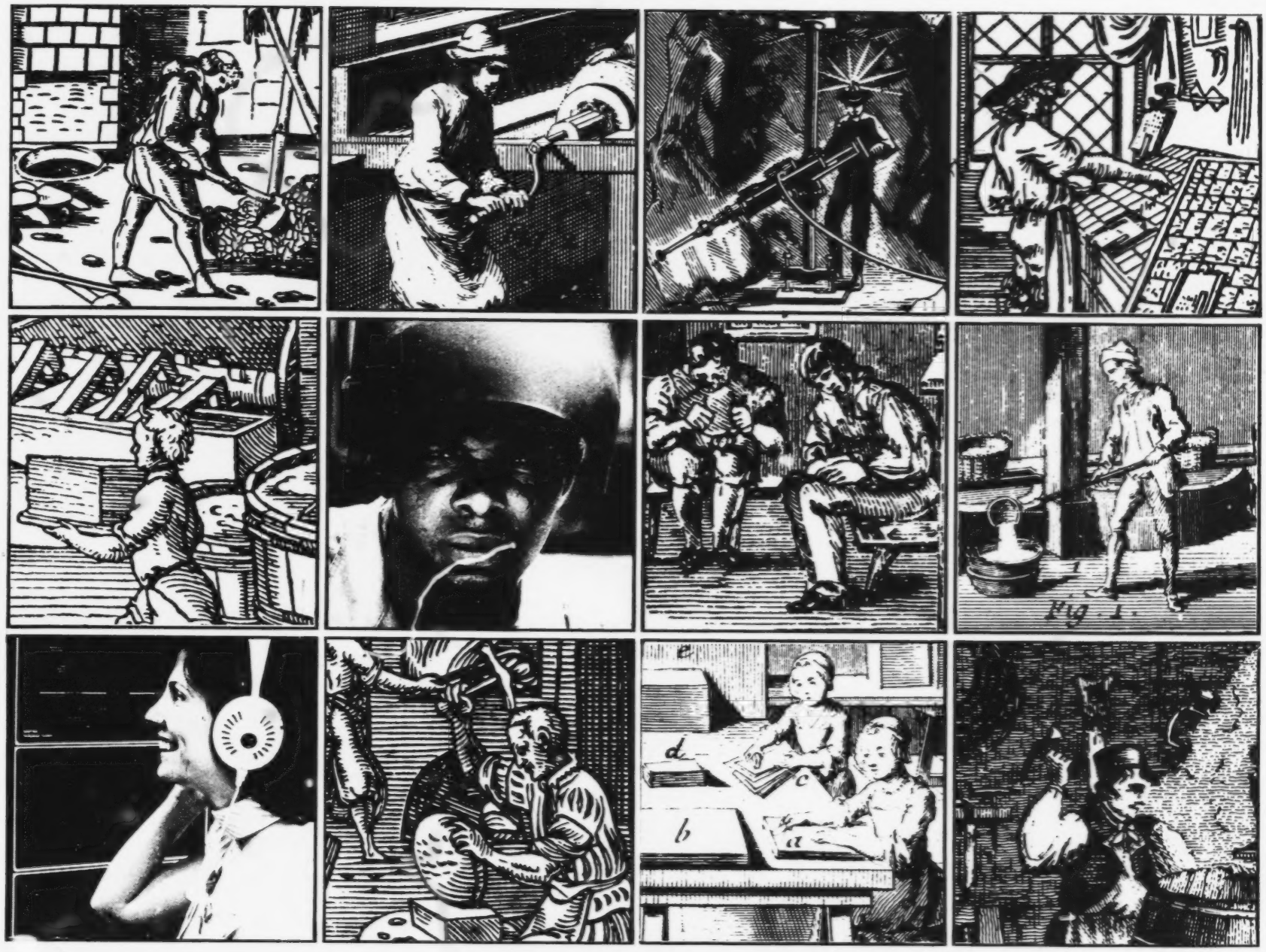
---

[4] See *Occupational Projections and Training Data,* BLS Bulletin 2058, published in Fall 1980. This item is designed for use by vocational guidance counselors and by planners of education and training programs.

[5] The 1970, 1978, and projected 1990 matrix provides employment data on 377 detailed occupations and 201 detached industries. The matrix is available in diffcrent formats to meet the needs of users with technical knoj ledge of BLS projection methods, including producers of occupational information for use at the State and local level.

[6] Results of the evaluations of the 1980 projections should be available in late 1981.

[7] See Carey.



Apprenticeships: **New Jobs** in an Old Tradition

Hundreds of occupations can be learned on the job through apprenticeships. Many of the skills learned in this way are as old as civilization itself—pottery and stonecutting, for example. Others were unknown or little needed just a few years ago. Changing products, technology, and production methods have created a demand for different types of craft workers, such as biomedical equipment technicians. Responding to these needs, the Bureau of Apprenticeship and Training, in the Employment and Training Administration of the U.S. Department of Labor, periodically adds trades to its list of apprenticeable occupations. Listed below are occupations that have been approved as apprenticeable since "Apprenticeship Now" appeared in the Summer 1978 issue of the *Occupational Outlook Quarterly.*

Each entry gives the title of the occupation, it's industry designation—if necessary—the title as it appears in the fourth edition of the *Dictionary of Occupational Titles*—if the two title differ—the DOT number, the term of the apprenticeship in years, and a brief statement of the worker's duties. One year of an apprenticeship is roughly equivalent to 2,000 hours of on-the-job training. For further information about these apprenticeships, including their local availability, and about apprenticeships in general, contact the Bureau of Apprenticeship and Training, U.S. Department of Labor, Washington, D.C. 20213.

tion, and general education do I want?
- Where are the general education courses taught? At the school or elsewhere?
- Is the program approved by the State board of nursing?
- Is the program accredited by the National League for Nursing?
- If not accredited, why isn't it?
- What is the school's reputation?
- What percentage of the graduates pass the State board of nursing exams for R.N.'s?
- Where do the school's graduates work?
- What do they think of the school?
- What do the graduates of the school do now; that is, what kind of nursing do they practice?
- Is housing available through the school?
- Is living at the school required?
- How many credits can I transfer to a B.S.N. program if I decide to enter one after beginning my education?
- How much additional education will I need to earn a B.S.N. if I decide to get one after becoming an R.N.?

Need More Information?

A great deal of information about nursing and nursing schools is available. The following publications are among the most comprehensive:
- *Associate Degree Education for Nursing* (Price: $1)
- *Education for Nursing: The Diploma Way* ($1)
- *Baccalaureate Education: Key to a Professional Career in Nursing* ($1)
- *Baccalaureate Programs Accredited for Public Health Nursing Preparation* ($1.50)

Each of the above pamphlets, which are revised annually, lists programs accredited by the National League for Nursing, 10 Columbus Circle, New York, N.Y. 10019. They are available from the League.

Some programs, especially new ones leading to the A.D. degree, are not yet accredited by the League. These schools are listed along with all the accredited schools in the following pamphlet published by the League:
- *State-Approved Schools of Nursing—R.N.* (Revised annually; $4.95).

The following League publication lists sources of financial aid for nursing students:
- *Scholarships and Loans for Beginning Education in Nursing* (Revised annually; $1).

School catalogs also include information on financial aid available at the particular school.

Current information on salaries, working conditions, and the job outlook for nurses appears in the *Occupational Outlook Handbook, 1980–81 Edition.* The section on nurses is included in the following reprint: *Health Occupations (Dental Auxiliaries, Nursing, Therapy and Rehabilitation, Health Services Administration)* (Bulletin 2075-S28; $1.25) available from the regional offices of the Bureau of Labor Statistics, the addresses for which appear on the inside front cover of this magazine.

The Mandatory B.S.N.

The education of nurses is unusual in that for many years it was controlled by the major employer of nurses, the hospitals. Some Bachelor of Science in Nursing programs date back to the turn of the century, but the first associate degree programs started up little more than 25 years ago. Since then, there has been a steady decline of diploma programs and a corresponding growth of A.D. and B.S. N. programs. Recently, the situation has become more stable. At the present time, about half the programs lead to the A.D. degree and the other half are almost equally divided between diploma schools and B.S.N. programs.

Some leaders of the nursing profession feel that this trend has been beneficial. They feel that all education should be under the auspices of community or senior colleges or universities and that the distinction between an A.D. holder and a B.S.N. should be more firmly drawn. Most notably, the American Nurses Association took a stand that called for the B.S.N. to be the minimum educational requirement for entry into professional nursing, a term that was not defined. The Association's position had no legal effect, but State associations of nurses have tried to introduce legislation that would implement it, notably in New York and Ohio.

Since it is unlikely that any State legislature will act soon enough so that the cutoff date for entry into practice without a B.S.N. will be as soon as 1985, students can still enter diploma or A.D. programs confident that they can become R.N.'s when their education ends. However, attempts to implement the proposal will continue, and potential nursing students should keep track of what is going on in their State and in any other State where they might like to work. If State legislation is passed, nurses who are already working will not be affected. But new nurses would be. And it is possible that, in the future, a person could be licensed as an R.N. in one State but not qualify for a license in another.

For the counselor, an easy but ill-considered solution to the dilemma of how to advise students is to recommend that all nursing students enter B.S.N. programs. Reality forbids such advice, however, if for no other reason than that the existing B.S.N. programs do not have room for all the students now attending A.D. and diploma schools. In addition, at least some individuals are better served by the A.D. and diploma programs than they would now be by a B.S.N. program.

Prospective nurses should realize that the variety of programs now available provides the individual with both an opportunity and a risk. On the one hand, students have the chance to find programs and schools that suite them especially well. On the other hand, they may attend a school that does not prepare them for the career they want. Individuals would, therefore, be well advised to consider carefully the different kinds of roles that today's nurse can assume and to investigate fully the different kinds of education available to them.

How (not) To Apply to ~~Colleges~~ Colleges

By Jay Schleichkorn

Samples of letters written by college students are excerpted to demonstrate the deterioration of students' writing skills. The relative unimportance many college students and graduates attach to the art of writting letters of inquiry is emphasized. A checklist is provided to assist students in preparing letters requesting information from colleges and universities.

Every year, approximately 1,000 letters are received by the Department of Physical Therapy, State University of New York at Stony Brook. Many letters request applications, information on the curriculum and prerequisites, material on financial aid, or the general admission policies. Mail comes from all parts of the country. Letters are handwritten, typed, Xeroxed, mimeographed, hectographed, and carboncopied. No two pieces of correspondence are alike in style. The similarity of the requests is in the misspelling, poor sentence structure, incorrect tenses, improper verbs, sloppiness, run-on sentences, and a general lackadaisical approach in many of the letters. Writing letters seems to be a lost art for many college students.

Much has been written on the writing problem and the marked deterioration of students' writing skills. Quigley (1977) indicated that college professors complain that grammar and spelling skills are weak, construction is rambling, and ideas lack focus. The blame for the writing problem has been placed on everything from early schooling, to television, to the American economy. Conway (1977) suggested that the problem with the written word is partially a result of a changed attitude toward language itself, a feeling that carefully planned sentiments and sentences just do not matter anymore. It should also be noted that the possibility exists that many college students may still be subject to the ramifications of learning disabilities acquired at an early age. Edgar (1978) indicates that some junior colleges are offering intensive remedial reading programs for adults, many of whom could be classified as learning disabled.

The purpose of this article is not to pinpoint the origin of the problem in letter writing. By sharing information on the typical errors and examining samples of what college students have written, however, counselors and educators will become more aware of the need to improve the writing skills of their students.

You may ask who reads the initial communication that a student submits when seeking a college application or information about a program. Who sees the letter first is immaterial. Any student interested enough to ask for an application, especially to a professional program, should write the letter with the understanding that it will be an introduction and first impression of the student's education, character, and concern for others. The writer should also consider the possibility of having the initial letter become part of an official file subject to review by many persons, including an admissions committee.

During the past several years, a special folder has been maintained in the physical therapy department for unusual letters and envelopes. After you review hundreds of letters, it is obvious that many students make similar mistakes. A list of the top 20 errors and common practices, with actual samples, follows. (All samples are presented as received, but the names have been obliterated.)

*1. **No return address.*** The student neglects to include a return address in the letter. Often the return address is on the envelope, but students should not assume that envelopes are saved when dozens of pieces of mail are received daily.

*2. **Improper salutation.*** It varies from salutem lectori to the first name of a department chairman, from the incorrect gender to the name of a chairman from another university. See example on next page.

*3. **No signature.*** Numerous letters remain unsigned. Occasionally, the student types his or her name but forgets to pen the signature.

Jay Schleichkorn is an associate professor and chairman of the Department of Physical Therapy, State University of New York at Stony Brook. This article is reprinted from *Personnel and Guidance Journal,* January 1979. Copyright 1979, American Personnel and Guidance Association. Reprinted with permission.

THE JOB MARKET FOR

SIGNS OF IMPROVEMENT...

by Lisa S. Dillich

...Tomorrow

New graduates prepared to teach elementary school will face improved job market conditions during the 1980's, according to recent projections by the National Center for Education Statistics (NCES) and the Bureau of Labor Statistics. Equilibrium between the demand for and supply of newly qualified elementary school teachers is expected to be achieved by the middle of the 1980's, and a shortage of such teachers is expected to develop by the end of the decade. On the other hand, the supply of newly qualified secondary school teachers is projected to continue to exceed demand throughout the 1980's. The accompanying article, "Charting the Course," discusses factors underlying these trends.

The projected shortfall of newly qualified elementary school teachers could probably be filled by hiring more people from the teacher reserve pool—qualified persons who never taught or taught for a short time but left teaching to raise families or for other reasons. The projected shortfall also might entice more people to prepare for elementary teaching, with some increase in new entrants by the late 1980's.

At the secondary school level, declining enrollments through the 1980's are expected to aggravate the present oversupply of teachers. However, the worsening employment situation may discourage more people from secondary school teaching, causing the number preparing to teach at that level to drop well below the current number.

Students considering secondary school teaching would be well advised to explore other occupations as well. Those who are firm in their desire to teach, however, should not be discouraged—since some jobs will be available. Recent survey data has shown that newly qualified teachers are currently at least as successful in obtaining jobs as are persons trained in most other fields (see article, ". . . Now," next column). Prospective teachers should be aware, however, that opportunities differ by field. Data from NCES indicate that persons qualified to teach special education, mathematics, business, and general elementary experience the highest success rate in getting a teaching job and those qualified to teach music and art the lowest. Prospective teachers also should consider taking courses to prepare them for occupations where opportunities are better—in case they are not able to find a teaching job.

...Today

The much-heralded teacher oversupply of the early 1970's has begun to ease, according to a recent study by NCES, *How College Graduates Newly Qualified to Teach Fare in the Job Market.* This study, which describes what people who graduated from college between July 1976 and June 1977 were doing in February 1978, indicates that nearly 80 percent of those qualified to teach who applied for teaching jobs were teaching. In contrast, only about 65 percent of the members of the Class of '75 who prepared for teaching and who applied for teaching jobs actually were working as teachers in the Spring of 1976. From 1971 to 1973, the worst years for new teacher graduates, it's estimated that only about half of all applicants obtained teaching jobs.

Unlike liberal arts programs in general, teacher preparation programs aim at specific preparation for employment. This difference in focus is reflected in greater employment success for new teacher graduates than for graduates not qualified to teach—particularly those in the liberal arts. According to the 1978 survey, new bachelor's degree recipients prepared to teach—including those who didn't apply for teaching jobs—were less likely to be unemployed or underemployed and more frequently had full-time jobs in fields closely related to their majors than graduates not qualified to teach.

About 72 percent of the 177,200 new bachelor's degree graduates prepared to teach landed professional, managerial, or technical level jobs, jobs usually requiring a college degree, compared to 50 percent of all other bachelor's recipients. Twenty percent of those prepared to teach were unemployed or underemployed, that is, employed in jobs not usually requiring a college degree for entry—in sales, clerical, blue-collar, and service work. In comparison, 34 percent of those not qualified to teach were unemployed or underemployed. Furthermore, a smaller proportion of graduates qualified to teach than of all other graduates were outside the labor force raising families, in school full time, or not employed or seeking jobs for other reasons.

Lisa S. Dillich is a labor economist in the Division of Occupational Outlook, BLS.

TEACHERS IN THE 80'S:

CHARTING THE COURSE

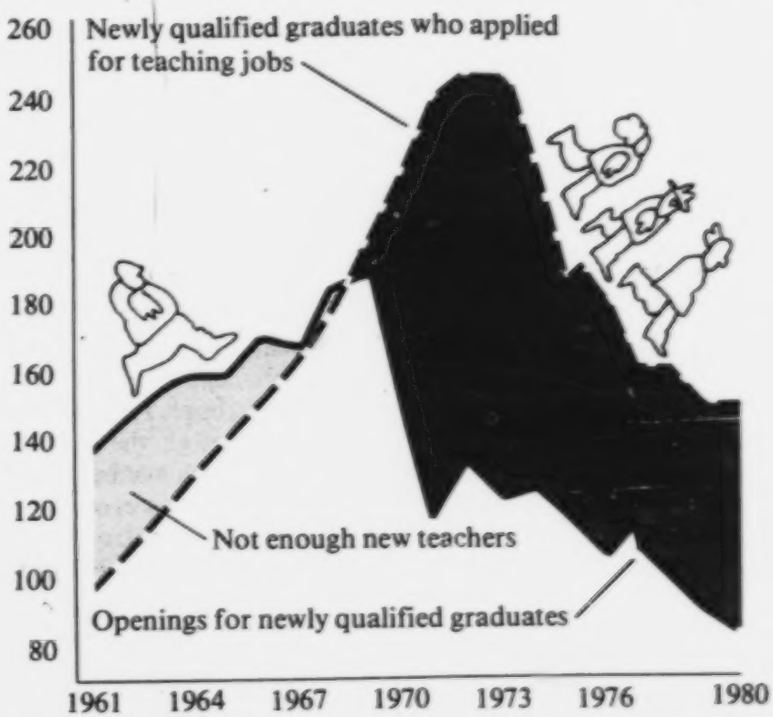
Past Trends

Over the past three decades, the supply of teachers has rarely been in balance with the demand. The accompanying chart, which shows the changing job situation for new teachers, illustrates how the teacher oversupply of the 1970's came about. A shortage of teachers characterized the 1950's and most of the 1960's. While annual job openings for teachers increased modestly through the 1960's, the number of college graduates prepared to teach increased more rapidly than openings, paralleling the sharp rise in the total number of bachelor's degrees. As a consequence, a rough balance between new teachers and job openings was achieved in 1967 and 1968.

By 1970, a surplus of new teachers had developed. The number of openings for new teachers dropped in the early 1970's as school enrollments started to decline—a result of declining births in the early 1960's. Openings for new teachers declined still further, as some employed teachers who might have left temporarily decided they could not risk an absence for fear they would not be rehired. The employment situation became even worse as the number of new graduates preparing to teach continued growing until 1973. As entering college students realized that teaching jobs were more difficult to find, however, they changed their career plans, and by 1974, the number of new graduates prepared to teach began to drop sharply. In 1972, 34 percent of bachelor's degree recipients were prepared to teach; by 1977, the proportion had dropped to 19 percent. Although the decline in job openings continued between 1972 and 1977, the decline in newly qualified teachers was even sharper, narrowing the mismatch.

The Supply of New Teachers Has Rarely Been in Balance With Demand

Thousands



Source: National Center for Education Statistics, National Education Association, and Bureau of Labor Statistics.

Outlook for the 1980's

The employment prospects for new teachers in the 1980's will depend on the behavior of a number of factors influencing the supply of and demand for teachers. While the future cannot be predicted with certainty, past trends can be analyzed and projections developed for each of these factors to provide some idea of what the future is likely to look like.

YOU'RE A WHAT?

CRUISE DIRECTOR

Most people may be inclined to label the job of cruise director as a "glamour" job—somewhat of a cross between a career in travel, in the entertainment field, and in the resort industry. Even before *The Love Boat* television series, the average person was likely to imagine that being a cruise director was more like fun than work.

In reality, these shipboard professionals work very hard. They don't know what a 9-to-5 workday is like, since they work an average of 16 hours daily. They direct large staffs that each day stage a decathalon of events—activities such as shuffle board tournaments, dance lessons, exercise classes, golf clinics, shore excursions, lectures, and a myriad of other pastimes.

Yet, there are many attractions to life as a cruise director, including challenge, variety, travel, and an unusual workplace. To find out what a cruise director does while at sea and work, we talked to Tony Noice, cruise director for Sitmar Cruises, in a brief interlude while he regained his land legs and vacationed at home. (Where else?)

OOQ: How did you get started as cruise director?

Noice: I was appearing in a nightclub show in the Bahamas when a cruise director on one of the ships in port broke his leg. An official of the com-

pany who ran the cruise line called me since I had worked as an entertainer for the cruise line before. He said, "Can you take over as cruise director?" And I said, "Sure." Since 1975 it's been my main job, but I'd done cruise directing for 15 to 18 years prior to 1975 for much shorter periods of time.

OOQ: What are your main duties as cruise director?

Noice: My job is to supervise all aspects of the cruise other than the navigation and hotel services. I plan and direct the entertainment, shore excursions, religious services, and all recreational activities. Of course, I have the assistance of a large staff of some 55 to 60 persons consisting of about 12 to 15 musicians, 6 actors and entertainers, and various assistants. My chief duty is to make sure that the cruise is enjoyable and lives up to the dream vacation that the guests envision.

OOQ: The last job duty sounds a little vague—how do you know what their dreams are—can you explain a little?

Noice: Sure. This is a crucial task which every cruise director understands or should understand. The cruise director must create a dream-come-true atmosphere filled with spontaneity and a feeling of having a marvelous time. So, we plan a range of activities to please and entertain all of our guests—who number, on the average, 900 persons. As you know, people can be very different and enjoy different things so we have a lot of variety—someting for everyone. And, we have lots of help: The ship's abundant supply of gourmet food, recreational facilities—such as swimming pools, and game rooms—discos, theaters, and round-the-clock room service.

OOQ: How many cruise directors are there in the United States?

Noice: About 35 ships use cruise directors, but there may well be 200 to 300 cruise directors. Many of these cruise directors work only a few months of the year on board the cruise ship and work at other jobs for the rest of the year. They work as actors, actresses, singers, and entertainers in the months ashore.

OOQ: How much time do you spend at sea and what do you do during the time you spend ashore?

Noice: I work from 6 to 9 months of the year as cruise director aboard the S.S.T. Fairwind or S.S.T. Fairsea. For the remaining months of the year I go back to New York where I audition for musicals and plays. Occasionally I do public relations tours for Sitmar Cruises which takes me to cities around the country.

OOQ: What training did you have to prepare you?

Noice: None, as far as cruising is concerned—but a lifetime in front of audiences. Most cruise directors have backgrounds in entertainment, but that's not mandatory by any means. A cruise director does need to be an extrovert, personable, well-organized, and also have a flair for administration, since there are so many details to be coordinated. The administrative half of the job is important, but most people can pick that up. The really important thing, as I mentioned before, is being able to successfully fulfill this dream ideal of the cruise goer.

OOQ: Even if the cruise director is successful in creating a dream world for the guests, life can't be all fair skies and shining seas for cruise directors. There must be some bad aspects of the job.

Noice: Well you are always in the public eye. And you are at work for as long as you are awake—about 16 hours a day. There's no such thing as a day off. If you like that sort of life, it's marvelous; but if you don't, it's terrible.

OOQ: How about seasickness? Do cruise directors suffer from it?

Noice: Well, some get it and some don't. If you don't, that's great. But if you do, you take your seasickness pill and go to work.

OOQ: What are some of the good aspects of the job?

Noice: The cruise director lives as a passenger so you live very well. The food is always good and the working conditions are pleasant.

It's a good life for actors, actresses, and entertainers since it's very steady work. Also, as a cruise director a person from the entertainment field fulfills one lifelong dream, of sorts. Not only is it a chance for steady work, but it also provides a full complement of musicians, entertainers, and stage over which the cruise director has complete control.

OOQ: What's the salary of a cruise director like?

Noice: The range for cruise directors, I would say, is about $250 per week for a small ship to $1000 a week for a large one. Of course, you must remember the cruise director incurs no living expenses such as for food or housing while on board. All this is provided.

OOQ: Are there positions which can prepare a person for the job of cruise director?

Noice: Cruise assistants' jobs generally would acquaint an individual with the detail a cruise director handles. Cruise assistants have all kinds of backgrounds, but a useful preparation may be a degree in recreation. There's a big turnover in jobs as assistants because they work hard and don't earn much—about $125 to $200 per week depending on the size of the ship. And that's for a 16-hour day.

Cruise director is an important position aboard a ship and so no employer is going to take a chance on hiring a stranger. You must be fairly well-known in the cruise world to get hired and one good way to get this qualification is by working on board as an entertainer. Or you can also become a cruise assistant and work your way up, but this may be more difficult to do.

Gail M. Martin, an OOQ staffwriter, interviewed Mr. Noice.

U.S. Department of Labor
Ray Marshall, Secretary

Bureau of Labor Statistics
Janet L. Norwood, Commissioner

The Occupational Outlook Quarterly is published four times per year, $6 domestic, $7.50 foreign, $1.75 single issue, by the Occupational Outlook Service, Bureau of Labor Statistics, U.S. Department of Labor, Washington, D.C. 20212. Second-class postage paid at Riverdale, Md. (USPS 492-690). POSTMASTER: Send address changes to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

SUBSCRIPTIONS AND SALES ARE MANAGED BY THE U.S. GOVERNMENT PRINTING OFFICE. Correspondence regarding subscriptions should be addressed to the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Prices are subject to change by the U.S. Government Printing Office.

EDITORS'S NOTE: Articies contributed by authors outside of the U.S. Department of Labor do not necessarily represent the views of the Department. Communications on editorial matters should be addressed to the Editor, Occupational Outlook Quarterly, Bureau of Labor Statistics, Washington, D.C. 20212. Phone: (202) 523-1386

The Secretary of Labor has determined that the publication of this periodical is necessary in the transaction of the public business required by law of this Department. Use of funds for printing this periodical has been approved by the Director of the Office of Management and Budget through June 30, 1984.

BUREAU OF LABOR STATISTICS REGIONAL OFFICES

Boston
1603 JFK Federal Bldg.
Boston, Mass. 02203
Phone: (617) 223-6727

New York
Suite 3400
1515 Broadway
New York, N.Y. 10036
Phone: (212) 944-3121

Philadelphia
P.O. Box 13309
Philadelphia, Pa. 19101
Phone: (215) 596-1154

Atlanta
1371 Peachtree St. NE.
Atlanta, Ga. 30367
Phone: (404) 881-4418

Chicago
9th Floor, Federal Office Bldg.
230 South Dearborn St.
Chicago, Ill. 60604
Phone: (312) 353-1880

Dallas
2nd Floor, 555 Griffin Square Bldg.
Dallas, Tex. 75202
Phone: (214) 767-6971

Kansas City
911 Walnut St.
Kansas City, Mo. 64106
Phone (816) 374-2481

San Francisco
450 Golden Gate Ave., Box 36017
San Francisco, Calif. 94102
Phone: (415) 556-4678

OCCUPATIONAL OUTLOOK QUARTERLY

Volume 24, Number 4
Winter 1980

Melvin C. Fountain, *editor*
Neale Baxter, *managing editor*
Gail M. Martin, *staff writer*
Richard Mathews, *art director*

Job Outlook Projections: Why Do Them? How Are They Made? How Accurate Are They? Michael J. Pilot **2**
Behind the simple statement that an occupation is projected to grow lies a complicated analysis of the economy; here's a look at the kind of analysis performed for material in the Occupational Outlook Handbook *and an evaluation of the accuracy of previous projections.*

Apprenticeship: New Jobs in an Old Tradition **9**
These occupations had not yet been approved as apprenticeable when the Occupational Outlook Quarterly *discussed apprenticeships 2 years ago.*

Three Ways To Become an R.N.: Is One Best for You? Neale Baxter **12**
The education of nurses has greatly changed in the last 30 years and will probably keep changing; but, for the moment, baccalaureate, associate degree, and diploma programs all prepare registered nurses (R.N.'s).

How Not To Apply to College Jay Schleichkorn **19**
Any college will gladly reject you if you just follow these 20 rules for composing a shabby letter of application.

NOICC: A Coordinator for Occupational Information Russell B. Flanders **22**
The National Occupational Information Coordinating Committee (NOICC) encourages the many Federal and State agencies that produce and use occupational information to work together.

Grab Bag **28**

You're a What? Numismatist **30**
A penny saved is just a start for a numismatist.

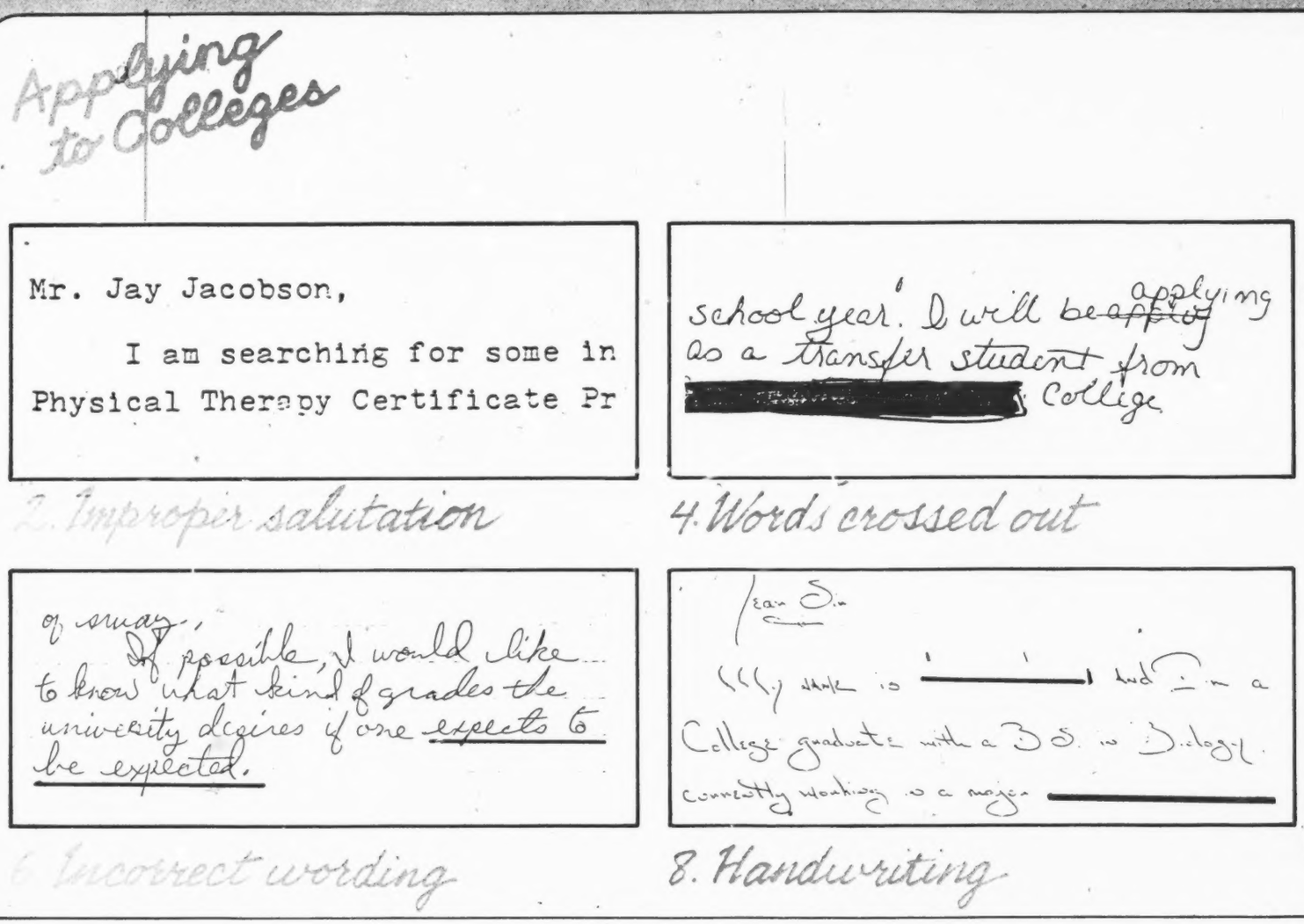
Counseling Aids **32**

Apprenticeships

Occupations Approved for Apprenticeship Since June 1978

Occupation	*DOT number*	*Term in years*	*Duties of worker in the occupation*
Air conditioning mechanic (Auto. serv.)	620.281-010	1	Services air conditioners and related parts in automobiles and other vehicles.
Alarm operator	379.162-010	1	Operates fire alarm system, using radio, telephone, and, sometimes, telegraph; determines size, location, and nature of fire and dispatches appropriate equipment.
Automatic-Equipment technician (tel. & tel.)	822.281-014	4	Services telegraph equipment such as teletypewriters.
Automobile-Radiator mechanic	620.381-010	2	Repairs cooling system and fuel tanks in automobiles and other vehicles.
Automative cooling system diagnostic technician [no entry in DOT]	620.261-580	1	Inspects, tests, and makes minor repairs to automotive cooling system, including air conditioners, radiators, and heaters.
Automotive mechanic (recreational vehicle) [no entry in DOT]	620.281-087	4	Services engines and other equipment, including plumbing, generators, and air conditioners, on recreational vehicles.
Automotive parts counter clerk [Sales person, parts]	279.357-062	2	Sells automotive equipment; determines parts required; and, when no replacement is available, advises customer of substitutes.
Biomedical equipment technician	719.261-010	4	Inspects, maintains, calibrates, and modifies electrical and mechanical equipment used in medical therapy and diagnosis.
Beekeeper	413.161-010	4	Raises bees; maintains hive and swarm, and harvests and sells honey and royal jelly.
Building maintenance servicer-repairer [Maintenance repairer, building]	899.381-010	2	Services faucets, drains, appliances, pumps, heating and cooling systems, playgrounds, pools, windows, screens, and doors.
Cable television lineman [Television cable installer]	821.231-010	1	Installs cables for community antenna television systems in customer's home, measuring strength of signal at the utility pole.
Combination welder [Welder, combination]	819.384-010	3	Welds metal to make or repair products using arc and gas welding equipment.
Computer programmer [Programmer, business]	020.162-014	2	Converts information to flow charts for coding into computer language; writes instructions for operators.
Control room technician [Audio operator]	194.262-010	2	Regulates volume and quality of sound during televsion broadcasts; synchronizes sound with picture.
Correction officer	372.667-018	1	Guards inmates in prisons and similar institutions.
Data processing technician [Computer peripheral-equipment operator]	213.382-010	1	Operates computers and auxiliary equipment.
Dental assistant	079.371-010	1	Assists dentists with routine and special dental procedures, keeps records, and does laboratory work.
Embalmer	338.271-014	2	Prepares bodies for burial and may arrange funerals.
Fiberglass swimming pool technician [Swimming-Pool servicer]	891.684-018	2	Cleans and services swimming pools, including filtering, heating, and pumping systems.

Occupation	*DOT number*	*Term in years*	*Duties of worker in the occupation*
Floral designer	142.081-010	1	Designs and makes arrangements of live, cut, dried, and artificial flowers; demonstrates floral design.
Funeral director [Director, funeral]	187.167-030	2	Arranges and directs funeral services; directs preparation of bodies for shipment.
Legal secretary	210.362-010	1	Prepares legal papers such as summones, complaints, motions, and subpoenas.
Machine tool builder [Machine builder]	600.281-022	2½	Puts machines together following blueprints, manuals, engineering memos, and knowledge of machine construction.
Medical secretary	201.362-014	1	Performs secretarial duties in a medical setting.
Meteorologist	025.062-010	3	Studies and predicts the weather.
Nursing assistant [Nurse aide]	355.674-014	1	Helps care for patients and works with other medical workers.
Physical therapy technician	076.244-010	1	Under the direction of a physical therapist, administers therapy such as exercise, massage, and heat treatment to patients.
Private-Branch-Exchange Installer	822.381-010	4	Installs telephone switchboards and other equipment.
Precision lathe operator [Engine-Lathe set-up operator]	604.280-010	2½	Sets up and operates engine lathe, the basic metal-machining lathe or turning machine.
Precision mill operator [Milling-Machine set-up operator]	605.280-010	2½	Sets up and operates a variety of milling machines that cut, shape, or finish metal or other substances.
Production coordinator (TV & radio) [Program assistant]	962.167-014	3	Sets up and operates equipment, performs operator maintenance on equipment; and directs preparation of sets.
Quality control technician	012.261-014.	2	Inspects products throughout production and interprets engineering drawings to determine standards.
Reproduction technician (microfilm technician)	976.361-010	1	Duplicates printed material photographically.
Stencil cutter (loco. & car bldg. & repr.)	970.387-038	2	Designs and cuts stencils for railroad cars.
Transmission mechanic (Auto specialty shops only)	620.281-062	2	Repairs manual and automatic transmissions in automobiles and other vehicles.
Vending machine mechanic [Coin-Machine-Service repairer]	639.281-014	3	Installs and services vending, amusement, and other coin-operated machines.
Weather observer (Meteorological technician)	025.267-014	1½	Uses and cares for weather-monitoring equipment, including radar.
Welding and plasma arc machine operator [Welding machine operator, arch]	810.382-010	3	Sets up and operates arc-welding machine that welds metal parts together.



4. Words crossed out. Rather than rewrite a neat letter, the student finds it expedient simply to cross out any mistakes.

5. No date. The date may be important if the student attempts to follow up on the letter.

6. Incorrect wording. In the above sample, the word should have been *accepted* rather than *expected.*

7. Poor typing. In many letters, it is obvious that it is time to change the typewriter ribbon. Letters are so light that they are difficult to read.

8. Handwriting. If a typewriter is not available, the student may elect to write the letter by hand. The reader should note the variety of handwriting styles, some of which are extremely difficult to decipher.

9. Poor photocopy. Photocopies of letters requesting material come in many shades of gray. Photocopies may be acceptable as long as they can be read. Individual signatures would be appropriate.

10. Word repetition. This occurs when the student does not reread what was written. Repetition can be avoided by checking the letter carefully.

11. Letters in pencil. Those that have been recieved are often on postcards and appear to be at the level of third grade.

12. Abbreviations. Many students apparently prefer to take shortcuts in their letters. "Please send me info . . ." appears quite often. Sometimes, the abbreviation used is wrong.

13. Stationery. Our file includes letters written on pages torn from steno pads, yellow-lined paper, memo pads, strips of looseleaf paper, index cards, colorfully initialed personal notepaper, and plain white bond paper. Unusual designs or colored paper may draw attention but do not assist the student in gaining admission to college.

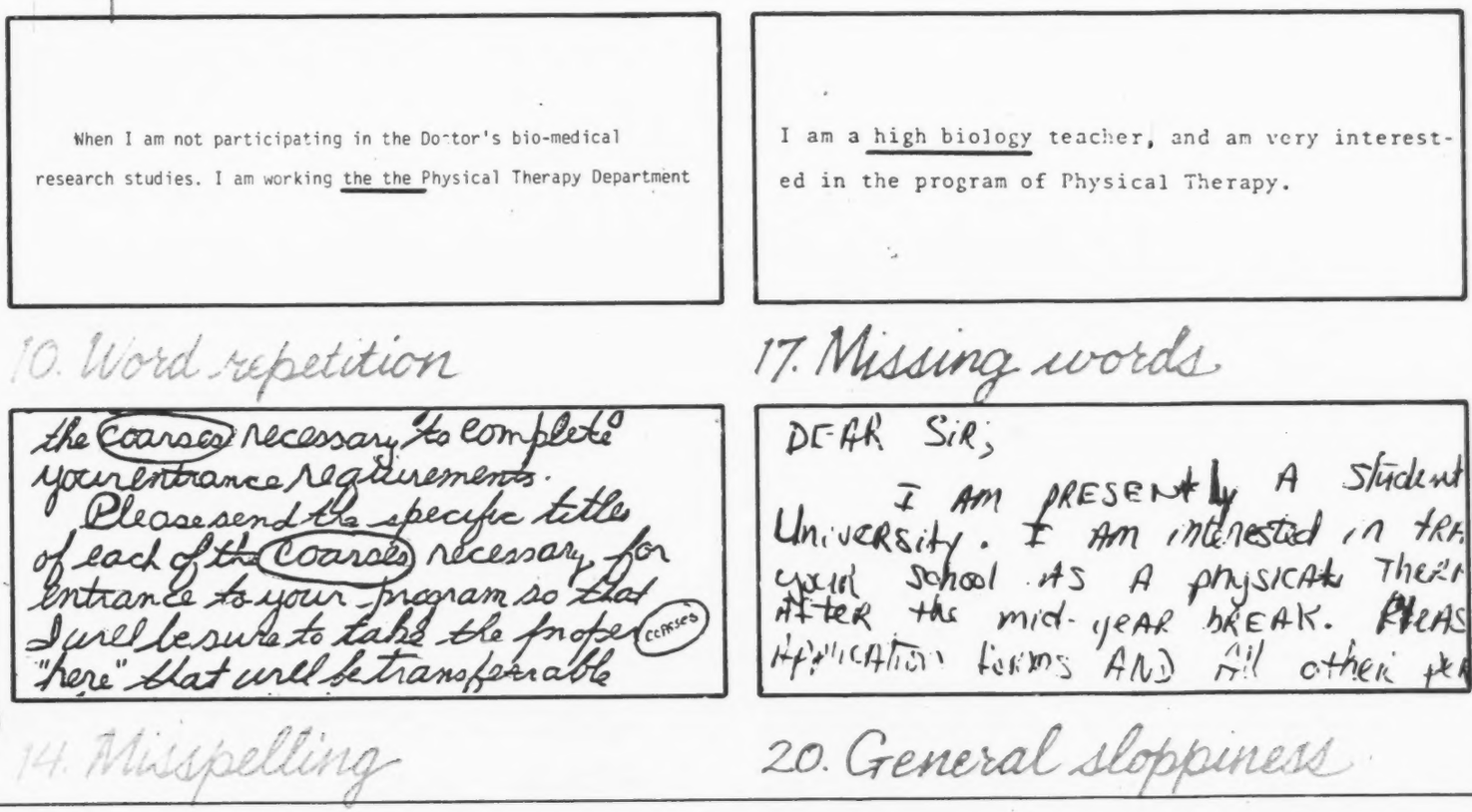
14. Misspellings. Consistently mispelled words are often found in the same letter. In the above example, the word *coarses* is used three times for *courses. Transferrable* for *transferable* also appears.

15. Incomplete sentences. Thoughts are left dangling, and the reader wonders how the writer progressed through college.

16. Wrong tense used. Present and past tenses are combined.

17. Missing words. Often a missing word makes for a humorous sentence.

18. Unusual envelopes and postcards. Picture postcards and plain cards are often used. The address on many envelopes is so poor that you may wonder how the mail was delivered.


When I am not participating in the Doctor's bio-medical research studies. I am working the the Physical Therapy Department
I am a high biology teacher, and am very interested in the program of Physical Therapy.
10. Word repetition
the Coarses necessary to complete your entrance requirements.
Please send the specific title of each of the Coarses necessary for entrance to your program so that I will be sure to take the proper courses "here" that will be transferable
17. Missing words
DEAR Sir;
I AM PRESENTLY A Student
University. I AM interested in the
your School AS A physical Therapy
After the mid-year BREAK. PLEAS
APPLICATION forms AND All other
14. Misspelling
20. General sloppiness

19. Special statement. Some students feel that a special statement on the envelope flap will result in a response.

20. General sloppiness. Many letters have a combination of poor handwriting, misspellings, unusual abbreviations, and errors.

These samples seem to indicate that only poorly written letters reach the School of Allied Health Professions. Such is not the case. Many letters are error free. It is surprising, however, how often mistakes are made in what seems to be a simple process of writing a short letter requesting information. The most unfortunate aspect of the special letter file is that every one of the letters was written by college students, many of whom are in the process of completing their education at the undergraduate level, have obtained a baccalaureate degree, or are pursuing graduate study.

As guidance counselors assisting students in seeking admission to a college or university, you are in a position to alert the students as well as faculty in your school to the need for improvement in letter writing. The next time a student mentions the need for an application or for college information, tell that potential college entrant to consider the following points in any correspondence:

1. Choose a clean piece of plain white paper.
2. Check the address of the school.
3. Be sure that the appropriate salutation is used.
4. If directed to an individual, is the name the right one?
5. Date the letter
6. Include a return address in the letter as well as on the envelope.
7. Keep the letter brief and to the point.
8. Check and double-check spelling.
9. Eliminate abbreviations.
10. Review sentence structure.
11. Sign the letter.
12. Make a copy.
13. Write legibly.
14. Double-check the address on the envelope.
15. Ask yourself, do you want the finished product to be your letter of introduction to the college or university?

References

Conway R. Nightmare of a college English teacher. *Newsday,* September 15, 1977, p. 98.

Edgar, E. B. Learning Disabilities. In R. M. Goldenson, J. R. Dunham, and C. S. Dunham (Eds.) *Disability and Rehabilitation Handbook.* New York: McGraw-Hill. 1978.

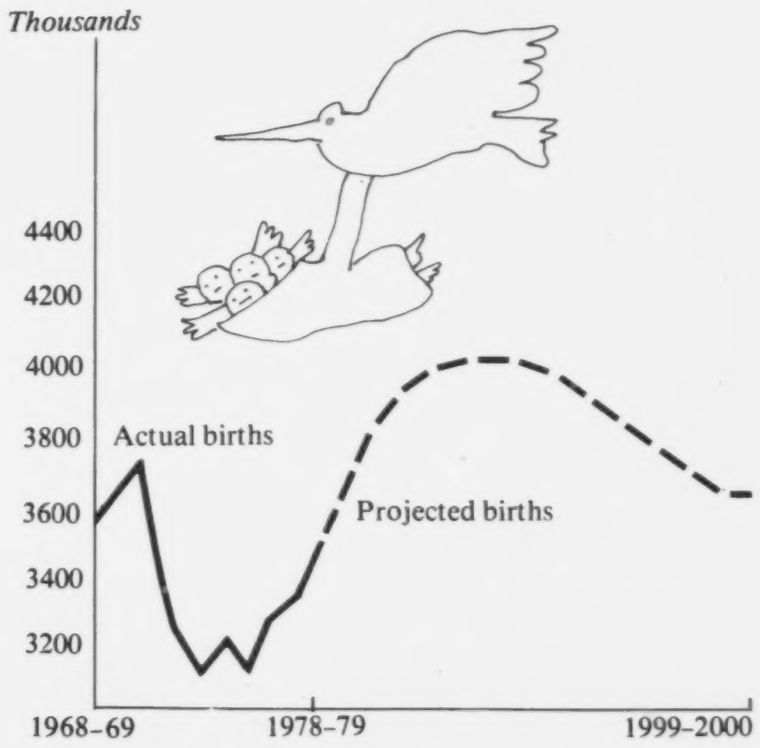
Quigley, M. Writing problem emerges as a major college headache. *New York University Alumni News,* 1977. 22(6).

Births

The number of births, after declining for 20 years, began to swing upward in the late 1970's. Although peoples' decisions about the number and timing of children are difficult to project, the Bureau of the Census expects the number of births to continue rising moderately through the mid-1980's as more and more women enter the prime childbearing ages.[1] Around 1987, births are expected to begin another decline.

[1] The projections presented in this article are based on the Census Bureau's series II (intermediate) population projections. The Census Bureau considers series I (high) and series III (low) projections very unlikely to occur during the 1980's.

Births Are Expected To Rise for a Few Years

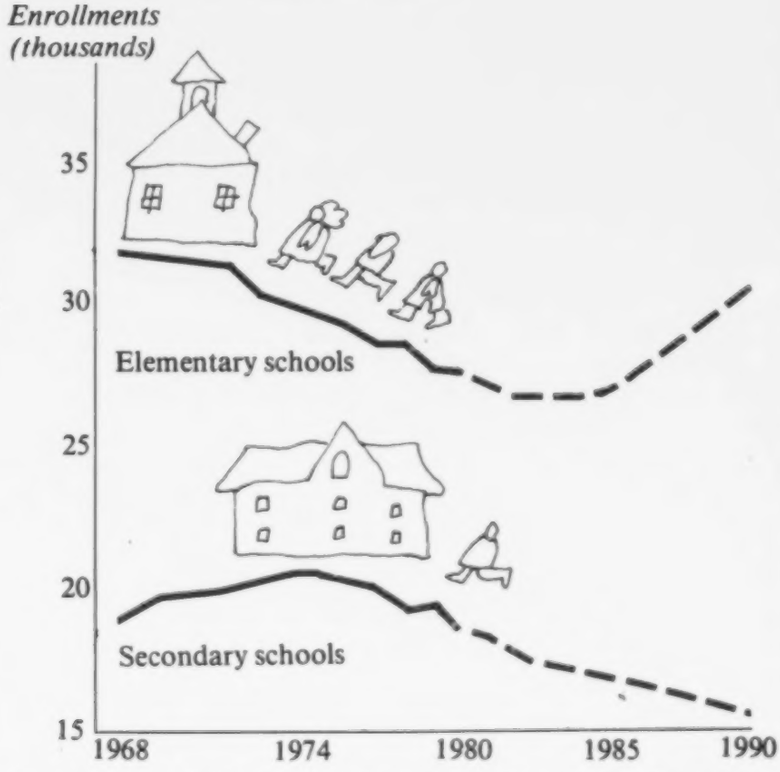


Source: Bureau of the Census, *Population Estimates and Projections, Series P-25,* Nos. 704 and 807.

Enrollments

Enrollment trends closely follow the trend in births by 5 years at the kindergarten level, 6 years at the first grade level, and so on. Kindergarten and elementary school enrollments are thus expected to decline through 1982, swing upward in 1983, and continue rising through the 1980's. The impact of a larger student population will not be felt in enrollments of 6th graders (12 years olds), however, until 1990. Secondary school enrollments will not be affected by the increase in births until after 1990. They are expected to continue their gradual decline through the 1980's, reflecting the decline in births during the 1960's and 1970's.

Enrollments Will Rise in Elementary Schools and Decline in Secondary Schools

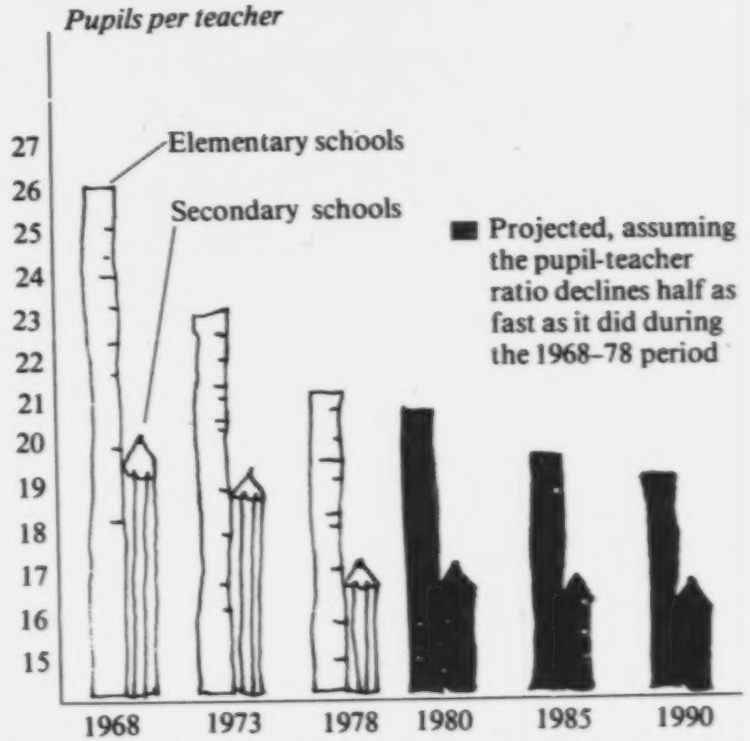


Source: National Center for Education Statistics, *Projections of Education Statistics to 1988–89.*

Pupil-Teacher Ratios

National Center for Education Statistics data indicate that if the pupil-teacher ratio declines half as fast as it did during the 1968–1978 period, a reasonable assumption, the number of pupils per teacher between 1980 and 1990 will fall from 20.6 to about 18.9 in elementary schools and from 17.0 to about 16.5 in secondary schools. Declines in pupil-teacher ratios could result, for example, from the injection of special education into regular classrooms and the introduction of other special programs such as music and art which require more teachers to teach a given number of students. In elementary schools this means that employment of classroom teachers will increase even faster than enrollments. At the secondary school level it means that teacher employment will not decline quite as rapidly as enrollments. If current financial pressures on local governments continue, however, it is possible that pupil-teacher ratios will not decline from current levels. This alternative is also considered in the following projections.

Pupil-Teacher Ratios Will Probably Continue To Fall



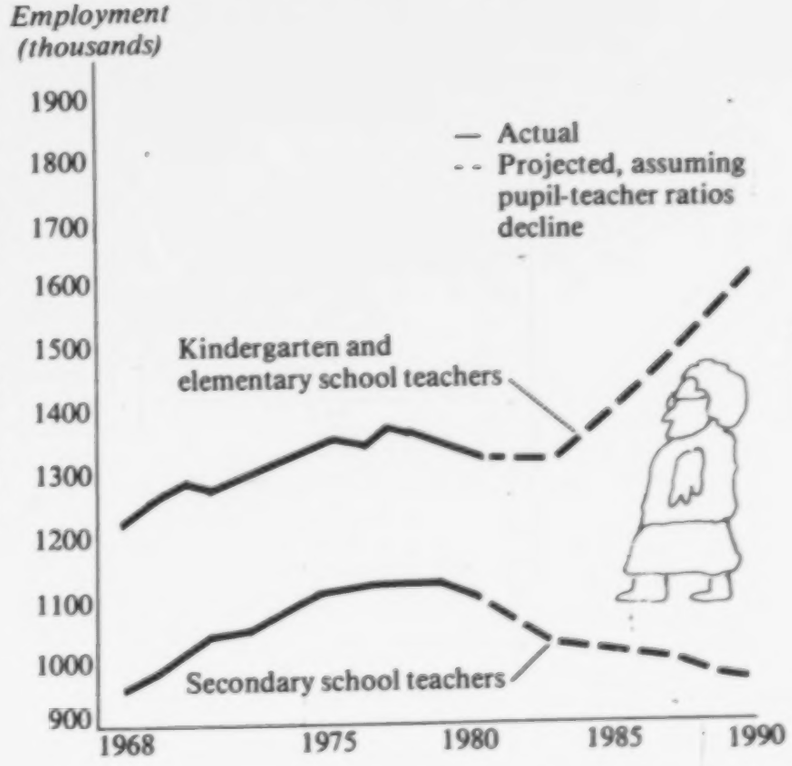
Source: National Center for Education Statistics, *Projections of Education Statistics to 1988–89.*

Employment

The decline in elementary school teacher employment which began in the mid-1970's is expected to continue until about 1983. After 1983, moderate increases in births and moderate declines in pupil-teacher ratios are projected to cause elementary school teacher employment to rise for the remainder of the 1980's. Because of the initial decline in employment projected for the beginning of the decade, the overall growth in elementary school teacher employment during the 1980's is expected to be around 280,000, or about 21 percent. If the pupil-teacher ratio remains at its 1980 level, however, employment is expected to grow by only about 150,000 during the decade, or about 11 percent.

Secondary school teacher employment, on the other hand, is expected to decline by almost 160,000 between 1980 and 1990, as a result of the projected decline in the secondary school age population—cushioned somewhat by the expected decrease in the pupil-teacher ratio. At the 1980 pupil-teacher ratio, however, the decline in teacher employment would be around 185,000.

More Elementary School and Fewer Secondary School Teachers Will Be Employed



COUNSELING AIDS

The publications discussed below, unless otherwise indicated, may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Enclose a check or money order made payable to the Superintendent of Documents. There is a minimum charge of $1 for each order.

Health Careers Guidebook has 221 pages packed with information about more than 100 different health occupations, including clinical laboratory services dentistry, dietetics and nutrition, education, health information and communication, health services administration, medicine, nursing, pharmacy, psychology, science and engineering, social work, technical instrumentation, therapy, veterinary medicine, and vision care. For each occupation, it discusses the nature of the job, training requirements, and opportunities. It also has sections on career planning and financial aid. Now in its fourth edition, this illustrated guide is published by the Employment and Training Administration (ETA), of the U.S. Department of Labor. It's available from the U.S. Government Printing Office. Stock no.: 029-000-00343-2; price: $5.25.

Federal Programs That Relate to Children, 1979, identifies the general nature and scope of on-going Federal activities that affect children. This 125-page book was prepared by the U.S. Department of Health, Education, and Welfare. Arranged by agency, it provides a brief description of the agency's programs, its authorizing legislation, the size of its budget, recent modification of the program, and the names of programs that have been authorized but not funded. Available from GPO. Stock no. 017-091-00227-4; price: $4.25.

For the Young Worker . . . Social Security, gives an explanation of the protection a young worker may receive immediately and in the future. Those benefits include disability payments, payments to survivors, and retirement benefits. It also points out that Social Security payments are inflation proof and invites questions by telephone. Available from any Social Security office listed in local telephone directories or the U.S. Department of Health, Education, and Welfare, Social Security Administration, Washington, D.C. 20203. Ask for HEW Publication No. (SSA) 79-10063. Free.

Job Rights for Reservists and Members of the National Guard is a 6-panel folder that presents questions and answers concerning National Guardsmen and their weekly, weekend, monthly, and annual training sessions and how these affect employment. The questions include: "Is an employer required to excuse a worker for military training duty?" "What is the employee's responsibility?" "How about vacation time? Can the military leave be charged against it?" Available free from the U.S. Department of Labor, Labor-Management Services Administration, Office of Veteran's Reemployment Rights, Washington, D.C. 20216.

Federal Contractor Job Listing uses questions and answers to describe the program through which employers with Government contracts of $10,000 or more must list job openings with the Federal-State employment service system. For example, it tells the reader that the employer decides whom to hire; however, under the provisions of the law and the Secretary's Regulation, the employer must take affirmative action to employ disabled veterans and veterans of the Vietnam Era and interview all applicants referred. Free from the U.S. Department of Labor, Employment and Training Administration, Washington, D.C. 20212.

Trio for Youth describes three ETA programs of the Department of Labor. These are Youth Incentive Entitlement Pilot Projects (YIEPP), Job Corps, and Learning Works, funded by the Comprehensive Employment and Training Act (CETA). Each helps young people, each is innovative. The 14-page pamphlet is available, free, from the U.S. Department of Labor, Employment and Training Administration, Washington, D.C. 20213.

Franchise Opportunities Handbook is published in support of the U.S. Department of Commerce's efforts to assist in establishing businesses owned by members of minority groups. Franchising is one of the rapidly growing forms of business because it offers a means through which individuals with limited capital and experience can own or operate their own business. This listing of equal opportunity franchisors provides a brief summary of the terms, requirements, and conditions under which franchises are available. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock No. 003-009-00320-2; price: $6.50.

Facing Facts About Vocational Education for Your Career, A Guide for High School Students, Their Counselors and Parents, is a 36-page booklet based on the idea that whatever kind of vocational preparation people may have so far received, they can still do more to fit themselves for a satisfying career. The chief ingredients needed are attitude, information, and skills training. Subjects discussed include changing attitudes toward vocational education and work, career education, self-employment, and sources of financial aid. It was published by the Prudential Insurance Company of America in 1975. Available free from Prudential, Box 36, Newark, N.J. 07101.

Need a Lift? is a 136-page handbook published by the American Legion Education and Scholarship Program to help students, parents, and counselors secure current information on careers, loans, and scholarships. Revised annually, it includes such sources of educational assistance for nonveterans and veterans and their dependents as Federal programs; church grants; American Legion, National Merit, and other privately funded scholarships; and programs offered through State governments. The booklet makes the point that students and parents should consider the combination of savings, scholarships, loans, and part-time employment to meet the expenses of education. Copies of the book may be ordered from local American Legion Posts, local American Legion Auxiliary Units, American Legion State Headquarters, or The American Legion, Need a Lift?, P.O. Box 1055, Indianapolis, Ind. 46206. Price: $1.

OFCCP: Making EEO and Affirmative Action Work describes the Office of Federal Contract Compliance (OFCCP). The pamphlet points out that for millions of Americans seeking jobs, promotions, or career benefits, equal employment opportunity (EEO) is more than another line in a help-wanted ad; it is a guarantee because more than 30,000 employers all over the country have contracts with the Federal Government. These employers must agree not to discriminate against qualified members of minority groups—religious, racial, or ethnic—women, veterans, or the handicapped. And they must take positive actions to hire and promote members of underrepresented groups. This 16-page publication discusses how the OFCCP enforces these contract provisions. Available free from the OFCCP, U.S. Department of Labor, Washington, D.C. 20210.

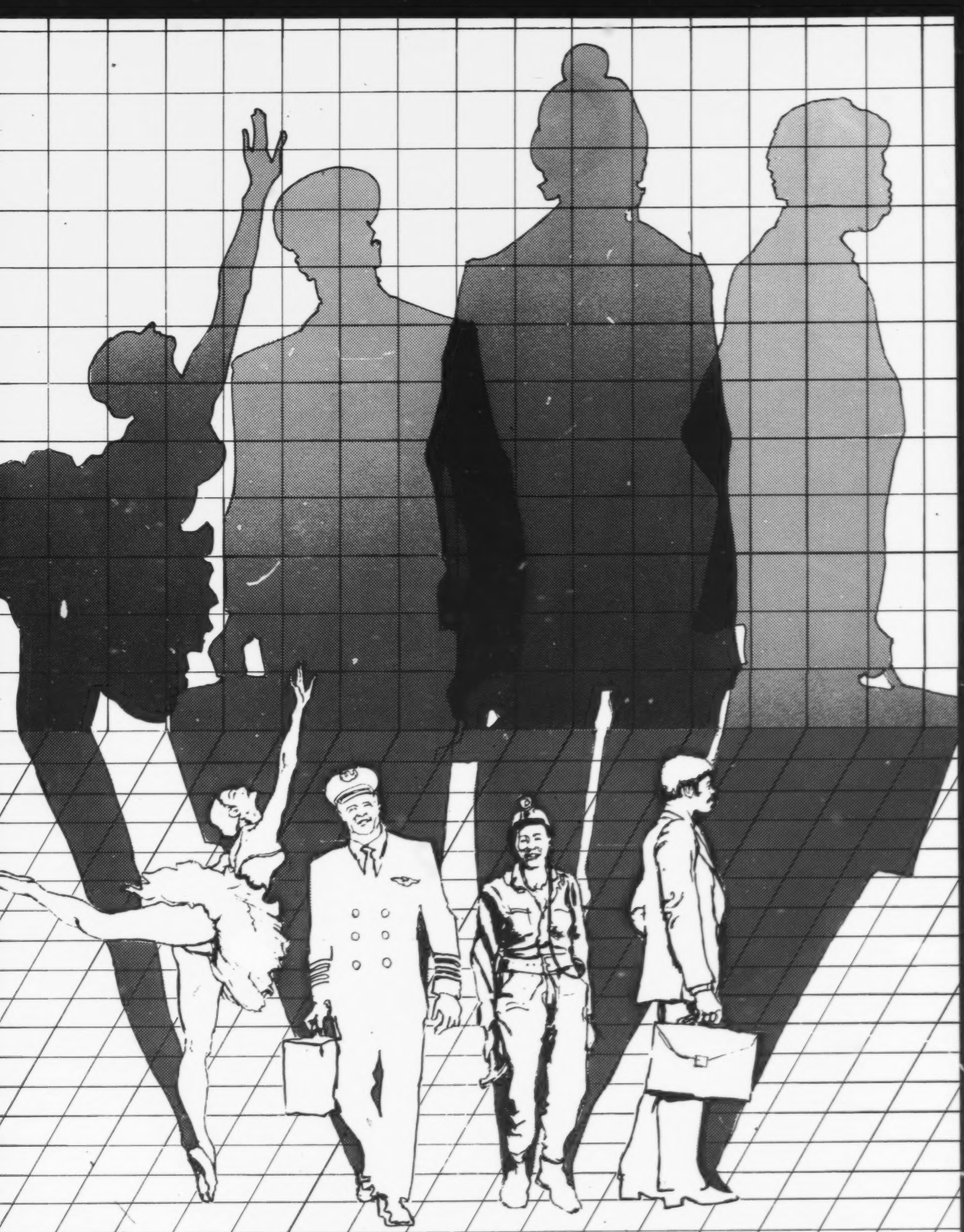
Guide to Farm Jobs: Intermountain States; Eastern Seaboard States; Western States are three multi-page booklets that indicate the harvest time for various farm products by States. Handy maps show many of the important crop areas. The addresses and phone numbers of local Job Service offices are given. Free from the U.S. Department of Labor, ETA, Washington, D.C. 20213.

Unemployment Insurance: How It Works for You is a 10-page booklet that answers common questions about unemployment insurance. Among the points addressed are what unemployment insurance is, who it helps, what the benefits are, who pays for it, and how to apply for it. Free from the Employment and Training Administration, U.S. Department of Labor, Washington, D.C. 20213.

Training Opportunities In Job Corps: A Directory of Job Corps Centers and Courses provides a list of vocational courses offered at 103 Job Corps centers located in 42 States, the District of Columbia, and Puerto Rico. Job Corps now conducts training at three types of facilities: (1) Civilian Conservation Centers—residential centers located in national parks, forests, and wildlife refuges and on other public lands (2) Contract Centers—training centers for 200 to more than 2,000 trainees operated under contracts with State or local governments, private nonprofit organizations, or profit-making organizations selected through competition (3) Extension Programs—advanced training at Job Corps centers, special training sites, and other locations such as junior or community colleges under contract with unions and public or private institutions. Free from the Employment and Training Administration, U.S. Department of Labor, Washington, D.C. 20213.

Women on the Job: Careers in Broadcasting, is a 26-page booklet published jointly by the American Women in Radio and Television, Inc., and the United States Department of Labor. It provides useful information to those who aspire to work in the broadcasting industry or in related fields. Among the points made is that women consider training for nontraditional jobs in the industry since these, as a rule, are the ones that command higher wages and offer better advancement possibilities. The publication offers job descriptions in broad areas of administration, art, engineering, legal, news, personnel, production, programming, promotion, and sales. It also lists colleges that offer degrees in broadcasting administration, 2-year colleges offering programs in broadcasting, and colleges and universities offering broadcasting courses. Available free from the American Women in Radio and Television, Inc., 1321 Connecticut Ave. NW., Washington, D.C. 20036 or the U.S. Department of Labor, Women's Bureau, 200 Constitution Ave. NW., Washington, D.C. 20210.

Seven Careers tells in capsule form how qualified people can help the blind. Among the occupations discussed are teacher, orientation and mobility instructor, rehabilitation teacher, rehabilitation counselor, social worker, therapeutic recreation worker, and occupational therapist. Workers in all of the careers help people overcome the problems imposed by a visual handicap. This 14-page booklet is available free from the American Foundation for the Blind, 15 West 16th St., New York, N.Y. 10011.



Job Outlook Projections

Why do them?
How are they made?
How accurate are they?

By Michael Pilot

The 1980–81 *Occupational Outlook Handbook* was published earlier this year—the Bureau of Labor Statistics' 14th edition. For each individual occupational writeup in the new *Handbook,* information is provided on nature of the work and working conditions, levels and places of employment, education and training requirements, employment prospects to 1990, earnings, and related occupations. To many *Handbook* users, however, the information about job prospects is probably considered the most important piece. It may also be the least understood.

The purpose of this article is to look at why projections of job outlook are made, the methods used in their development, and their accuracy.

Purposes, Importance, Concerns

Projections of occupational and industrial requirements and resources originally were developed by the BLS as an outgrowth of employment studies designed to provide career guidance information for individuals and for use to those responsible for planning education and training programs.[1]

Over the years as data and methods improved, projections have served other special purposes as well. For example, they serve to alert government officials and other interested parties to potential supply-demand imbalances in occupational areas such as science, engineering, medicine, and teaching; to study the employment impact or consequences of government policies and expenditures on programs dealing with defense, energy, health, and housing construction; and to examine changes in the utilization and skills of workers caused by creation of new technologies and changing patterns of industrial growth.

The major thrust of BLS efforts to develop information on future occupational and industrial employment requirements and resources, however, has been directed at the needs associated with career guidance and the planning of education and training programs. The role that projections play in decisionmaking has taken on greater importance over the past decade as competition for jobs has stiffened. Congress also has explicitly indicated that training programs financed by the government should be based on an assessment of future employment needs.

The increased use of job outlook projections to meet the needs of diverse consumers has generated a host of concerns about the uses and limitations of projections. On the one hand, proponents of projections—including producers of occupational information for use at the State and local level—frequently ask for more and different detail and for projections covering shorter time periods. Decisions on whether to accommodate these demands or not usually depend on the capabilities of the existing data sources and projection methods. On the other hand, critics view projections strictly from the standpoint of how accurate they are, and contend that many users accept the projections on blind faith and use them for purposes not intended and as a substitute for observation in decisionmaking rather than as an aid.

To understand the limitations of projections, it's important to look at what they represent, to consider what goes into their makeup, and, finally, to assess the level of accuracy needed by different users.

Employment Growth

Employment change in an occupation is one indicator of future job prospects. How and why the employment levels of occupations charge depends on many factors that interact in the economy.

Changes in population are among the basic factors that will affect employment opportunities because the demand for workers depends ultimately on the goods and services sought by the public. Growth and shifts in the age structure of the population will directly affect the types of the goods and services demanded. For example, a decline in the birth rate during the 1960's and early 1970's will cause a decline in the number of young people; and, consequently, the need for education sources will fall. On the other hand, as greater numbers of people born during the post-World War II "baby boom"

[1] An advisory Committee on Education appointed by President Roosevelt recommended in 1938 that an occupational outlook service be set up in the Bureau of Labor Statistics to conduct such studies. Projections, however, were not produced in any systematic manner until the early 1960's.

Michael Pilot is director of the Bureau of Labor Statistics' Occupational Outlook Handbook program.

Three Ways To Become an R.N.: Is One Best for You?

By Neale Baxter

This is a tale of three people who want to become registered nurses (R.N.'s). Thirty years ago, it would scarcely have needed telling, for, back then, almost all registered nurses received the same education. Some attended baccalaureate programs, but most went to schools run by hospitals. For 3 full years, they lived at the school, studied little besides nursing and such closely related subjects as anatomy, and worked in the hospital. By their third year, they were treated more like members of the hospital staff then students. Today, students may choose among three different kinds of programs usually offered by three different kinds of institutions:

- Schools of nursing associated with hospitals or independent schools of nursing that grant diplomas,
- senior colleges or universities that grant a bachelor of science degree (B.S.) or bachelor of science in nursing degree (B.S.N.),
- and community colleges or other institutions, including some hospitals, that grant associate's degrees (A.D.'s).

The programs have much in common. After completing any one of them, graduates may take the tests that their State's board of nursing requires of R.N.'s and work as staff nurses in a hospital or nursing home. But they also have important differences, even in the kinds of work that graduates may enter. For example, public health nurses must usually have a B.S. or B.S.N. The differences have given rise to a controversy as to whether all three programs should continue to educate R.N.'s. The controversy is discussed further in the box, entitled "The Mandatory B.S.N.," Education and the 1985 Resolution," which accompanies this article.

One way to differentiate among the programs is to list the characteristics of each, as is done by the National League for Nursing. Another way is to describe a student in each, showing why the student picked a particular school and what it's like. The students and schools described here are fictitious. Although typical, they do not exhaust the variations possible among students and schools. Since individual schools may adopt features usually associated with other types of programs, prospective nursing students should first determine what role they wish to fulfill as nurses and then look carefully into each school being considered rather than assume that all nurses or all schools granting a particular diploma or degree are alike.

Experiencing Nursing

Dave Saunders didn't always want to be a nurse, but he always wanted to help the sick. During high school, he realized that medical school probably wasn't for him. For one thing, it seemed as though it would take forever before he treated his first patient—and med school is expensive. So Dave read some books on different health occupations and talked things over with his parents, counselor, and various health-care workers. He didn't want to be a technician or a therapist, he learned. To his surprise, given the traditional picture of a nurse, it turned out that he wanted a career in nursing, particularly caring for the sick.

When Dave looked into nursing education, he frequently came across a term he'd never met before, "clinical experience." Judging from the school catalogs he read, clinical experience was an important part of the nursing courses he would take no matter what kind of school he went to. Since the term was new to him, he looked into the subject further and learned that clinical experiences differed a good deal from the things he had done in his high school courses, even the ones with science labs. The nursing lab would be the hospital, and the experience would be caring for patients under the guidance of an instructor.

Today's nurse possesses a highly diversified range of knowledge and skills, so Dave could understand why the nursing courses—and therefore the clinical experiences—at various schools differed quite a bit in structure even though they all had the same ultimate purpose: They were all designed to insure that the students learned and experienced the full range of nursing responsibilities for graduates of one of the three programs. Still, Dave had a lot of trouble figuring out how courses

Neale Baxter is managing editor of the OOQ.

NOICC: A Coordinator for Occupational Information

By Russell B. Flanders

Who has not sought information from a government agency only to find after 10 phone calls that the right office still has not been contacted? NOICC—the National Occupational Information Coordinating Committee—intends to improve that situation for people who seek information about government programs dealing with employment, occupations, or careers. It also is establishing standards for an Occupational Information System (OIS) and funding a wide range of projects dealing with information development and career counseling.

NOICC was established in 1976. It is supported by four other agencies: The Bureau of Labor Statistics, the Employment and Training Administration, the Office of Vocational and Adult Education, and the National Center for Education Statistics. The U.S. Departments of Education and Labor provide funds for NOICC use and are also the source of most of the information and data identified in the OIS, since NOICC itself is not a data-collecting agency. State Occupational Information Coordinating Committees (SOICC's) were mandated by the same legislation as NOICC. They are composed of representatives of the State Board of Vocational Education, the State Employment Security Agency, the State Employment and Training Council, and the State agency administering the vocational rehabilitation program. As of Summer 1980, 57 SOICC's were functioning, although several were newly staffed. Their addresses are listed at the end of this article.

Congress has given NOICC and the SOICC's the following responsibilities:

- Develop an OIS with standardized definitions, estimating procedures, and occupational classifications that meets the common occupational information needs of vocational education programs and employment and training programs at the Federal, State, and local levels.
- Assist the State Committees.
- Improve coordination and communication among the developers and users of occupational information.
- Give special attention to the labor market information needs of youth.

When carrying out these responsibilities, NOICC and the SOICC's are to encourage the delivery of information that

---

Russel B. Flanders is the Executive Director of the National Occupational Information Coordinating Committee (NOICC).

can be used for career exploration, decisionmaking, and job search. Specificly, NOICC must assist the State Committees in the development of State OIS's. Information in the OIS's is becoming accessible to local schools through a Statewide Career Information Delivery System (CIDS). Thus the goal of providing a single source for information about careers will be met through the fulfillment of two related tasks, the development of an OIS and the creation of CIDS's.

Toward a Standard OIS

Since no detailed description of the structure and content of an OIS existed before NOICC and the SOICC's were created, their first task was to prepare one. NOICC adopted existing material for the new OIS whenever possible. For instance, it chose to use the Standard Occupational Classification System of the Office of Federal Statistical Policy and Standards, U.S. Department of Commerce; and it decided that the Occupational Employment Statistics program of the U.S. Department of Labor would be the principal source of current and projected occupational employment data at the local, State, and national level for the OIS. NOICC, therefore, also adopted the labor market areas as defined by the U.S. Department of Labor as the geographical divisions for which data in the OIS should be developed.

The sources of information about the potential supply of workers in occupations are more deverse than the sources of information about employment. Supply information comes from the Employment and Training Administration's data reporting systems (for example, the State and National Apprenticeship System and the Employment Security Automated Reporting System); State Employment Security Agency programs, that is, the Employment Service and Unemployment Insurance Service; the Rehabilitation Services Administration's Case Service Report System; and the National Center for Education Statistics's data reporting systems, that is, the Higher Education General Information Survey, Vocational Education Data System, and Noncollegiate Postsecondary School Survey.

As can be seen, NOICC is not trying to reinvent the wheel. It will not implement another endless string of government programs. Rather, it will coordinate the efforts of Federal and State agencies that already collect, analyze, and publish the kind of data needed for an OIS. Similarly, NOICC and the State Committees will encourage the adoption of the standards developed for the OIS, requesting and supporting modifications of ongoing data collection programs when necessary and acting to prevent the duplication of efforts.

NOICC provides funds to the SOICC's and, to a lesser extent, to other agencies for OIS-related projects that are national in scope. NOICC also provides technical assistance to State Committees by developing training materials and sponsoring training sessions. For example, in 1979, it produced *A Framework for Developing an Occupational Information System* to provide guidance to the SOICC's on the scope and structure of an OIS. *A Framework* specifies that an OIS should have four elements: Occupational

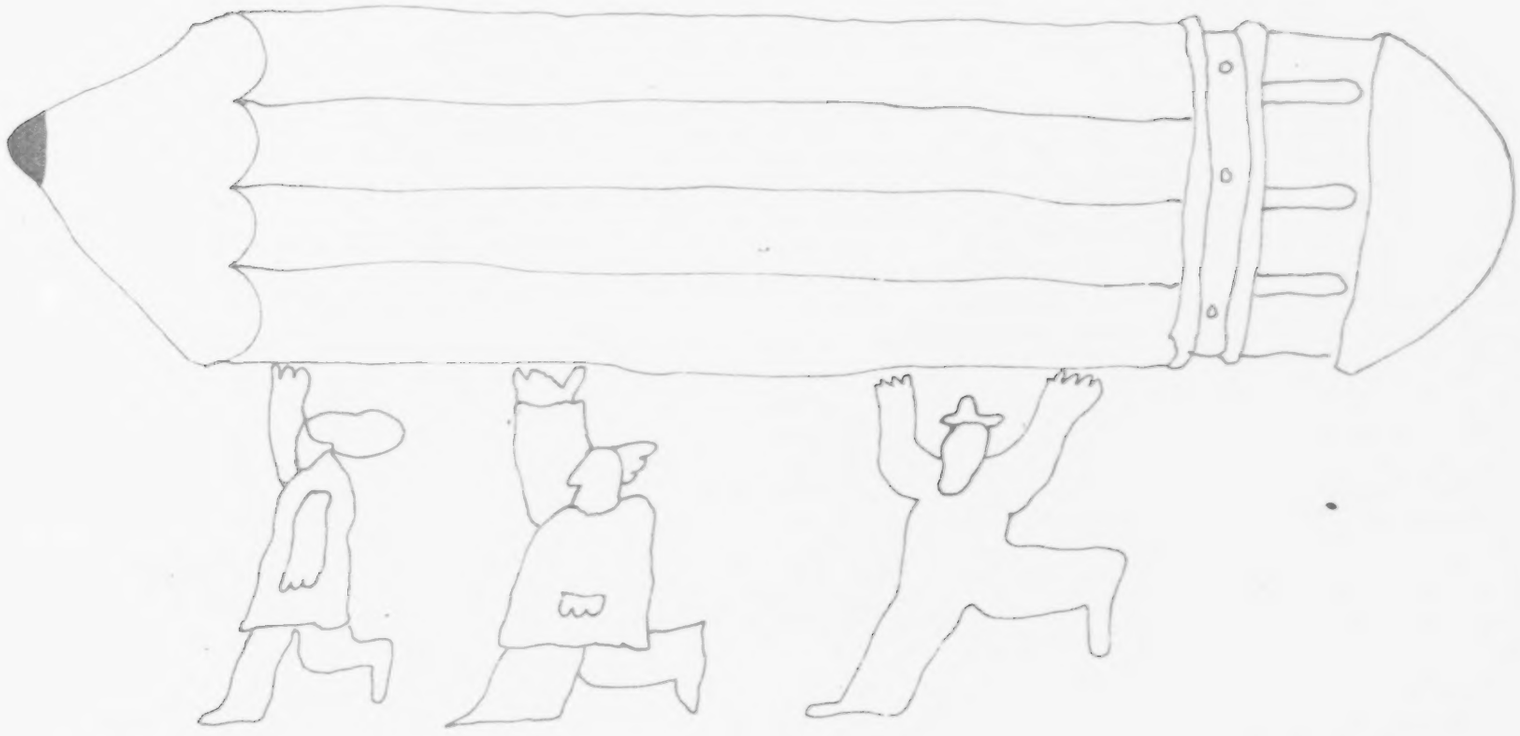
Openings

As in the past, most elementary and secondary school teaching vacancies will be to replace those leaving teaching. During the 1970's, about 6 percent of employed teachers retired, died, or transferred to nonteaching jobs each year. If this turnover rate remains the same during the 1980's, teacher turnover is expected to generate 840,000 elementary school vacancies (84,000 openings annually, on average). In secondary schools, teacher turnover is expected to account for all of the over 476,000 projected openings (about 47,600 a year, on average). Separations are projected to total 612,000, but because the demand for secondary teachers will decline, not all departing teachers will be replaced.

Replacement Needs Will Create Most Job Openings for Teachers

Education Level	Projected openings, 1980-90 (thousands)			
	Employment change	Replacement needs [1]	Total	Annual Average Total
With declining pupil-teacher ratio:				
Kingergarten and elementary	284	840	1124	112.4
Secondary	—136	612	476	47.6
With constant (1980) pupil-teacher ratio:				
Kindergarten and elementary	151	798	949	94.9
Secondary	—165	602	437	43.7

[1] Include openings arising from deaths, retirements, other separation from the labor force, and transfers to other occupations.



Supply and Demand

The supply of new teachers is projected to decline slowly through the 1980's, the result of a decrease in the number of bachelor's degrees expected to be conferred. Approximately 190,000 new bachelor's and master's graduates are expected to qualify to teach in 1980; this is equivalent to 20 percent of the 950,000 bachelor's degrees granted—9 percent at the elementary level and 11 percent at the secondary level. Assuming that this distribution and the current proportion of qualified graduates applying for teaching jobs (85 percent, elementary; 72 percent, secondary) remain the same, the projected supply of newly qualified graduates through the 1980's will be as shown in the accompanying chart. About 75,000 qualified recent graduates are expected to apply for elementary school jobs and another 75,000 for secondary school jobs each year during the early 1980's, with both numbers declining slowly through 1990.

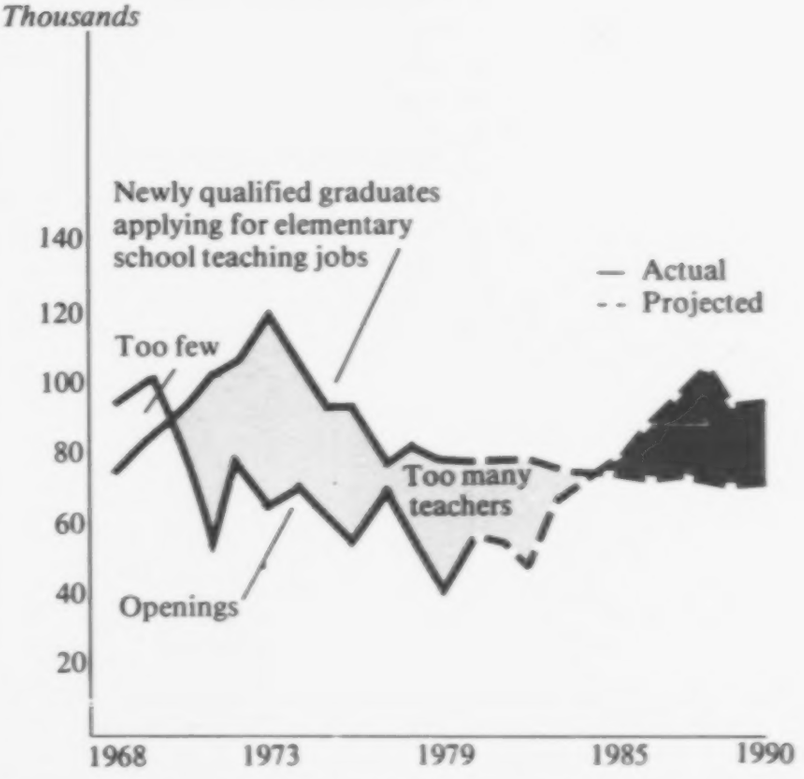
During the 1970's, an estimated 70 percent of teacher job openings were filled by newly qualified graduates. The remaining jobs were filled by people from the reserve pool of teachers—eligible persons who never had taught or who had taught for a while, but left teaching to raise families or for other reasons. If the same proportion of openings is filled by new graduates during the 1980's, then about 79,000 of the approximately 112,000 projected annual openings in the elementary schools and about 33,000 of the almost 48,000 projected annual openings in the secondary schools will be available for new graduates. However, an increase in the proportion of openings filled by new graduates to 75 percent, the level of the 1960's, or a decrease in the proportion to 65 percent would make a difference of about 5,600 openings a year on average for newly qualified elementary school teachers and about 2,400 openings a year for newly qualified secondary school teachers.

Assuming the proportion of openings going to new graduates remains the same as during the 1970's, the number of openings for new graduates at the elementary school level is expected to fall short of the number of new graduates applying until about 1985. Around 1985, higher elementary school enrollments and lower pupil-teacher ratios are expected to increase job openings for newly qualified graduates in line with the number of applicants.

If pupil-teacher ratios do not decline, elementary school teacher employment will grow more slowly, and a rough balance between the supply and demand for new graduates will occur a year or so later. Job openings for new graduates are expected to exceed the number of new graduates who apply beginning around 1986.

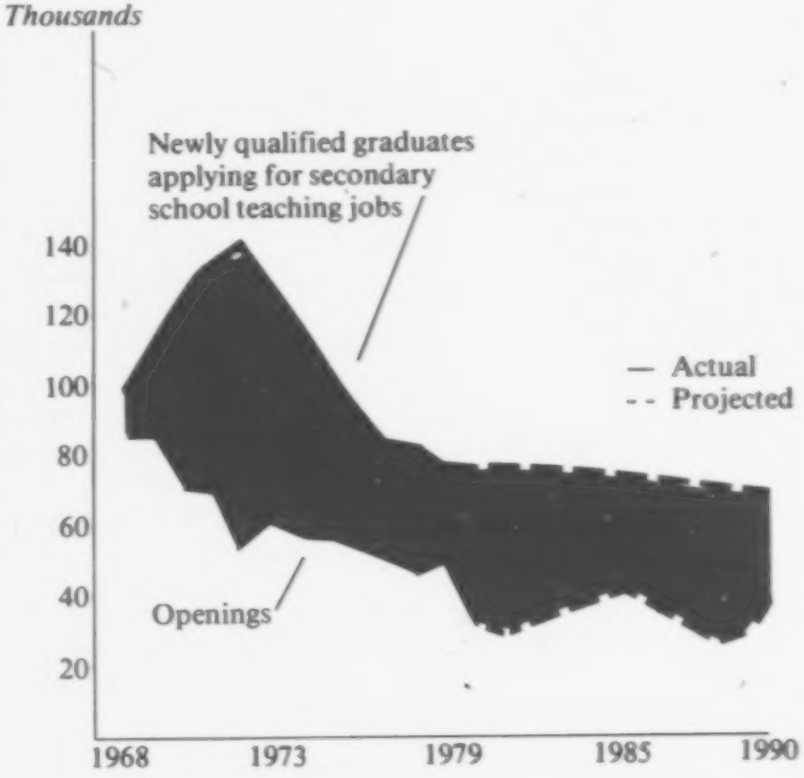
At the secondary school level, declining enrollments through the 1980's are expected to aggravate the present oversupply of teachers.

Job Prospects Will Be Good for Newly Qualified Flementary School Teachers . . .



Source: National Center for Education Statistics, National Education Association, and Bureau of Labor Statistics.

. . . But Not Good for Newly Qualified Secondary School Teachers



Source: National Center for Education Statistics, National Education Association, and Bureau of Labor Statistics.

GRAB BAG

Earnings Are Down

From July 1979 to July 1980, the average hourly earnings of production and nonsupervisory workers in the private industries other than farming rose 7.5 percent. But the increase didn't give workers more money to spend. In fact, they had less because of inflation, a decrease in the number of hours worked, and an increase in the taxes. Putting everything together - hourly earnings, hours worked, inflation, and taxes - the spendable earnings for these workers declined 7.4 percent.

But Some People Are Doing OK

A good deal is heard about the small number of star athletes who earn fabulous salaries for a few years. But if you really want to rake in the gold, train to become a chief executive officer instead of a quarterback. The chief executive officer is either the chairman of the board or the president of the company. Their desk is where the buck stops. And so do the bucks. In 1979, according to Forbes' June 9, 1980 issue, 60 of them had salaries, bonuses, and various options of $1 million or more. Five of them got more than $3 million. And their careers won't end when their legs begin to go.

College Women Choosing Business Over Education

In little more than a decade, the number of college women majoring in business has climbed from 204,000 to 819,000, or more than 40 percent of all business majors. During the same period (1966 to 1978), the number of women majoring in education fell from 760,000 to 601,000. All this information comes from a new study published by the Census Bureau.

According to the Monthly Labor Review (June 1980), women have also made significant gains in their share of employment in the mining and construction industries. Although female employment in both industries is still under 10 percent, the number of women went up 65 percent in mining and 74 percent in construction from 1968 to 1978.

Is There Work After Work?

It seems so. Susan Ford and Dean Morris found that 40 percent of the retired mid-level managers surveyed worked at least part time, and many of them worked 37 hours a week. The results of this survey of 1000 retirees appear in Aging and Work.

Soaring Solar

The Department of Energy projects that the number of persons working on solar energy in 1981 will be twice as high as it was in 1978, and in 1983, it will be nearly 3 times as high. The field is still quite small however, so despite its rapid growth, total employment in 1983 will be under 100,000. These projections are from Solar Energy Employment and Requirements, 1978-1983, a Department of Energy publication.

Employment Projections for the 1980's

Subjects include:

The labor force—expected changes in size and composition as a result of the continuing impact of the post-World War II baby boom, the increased participation of women, and the drop in the birth rate during the 1960's.

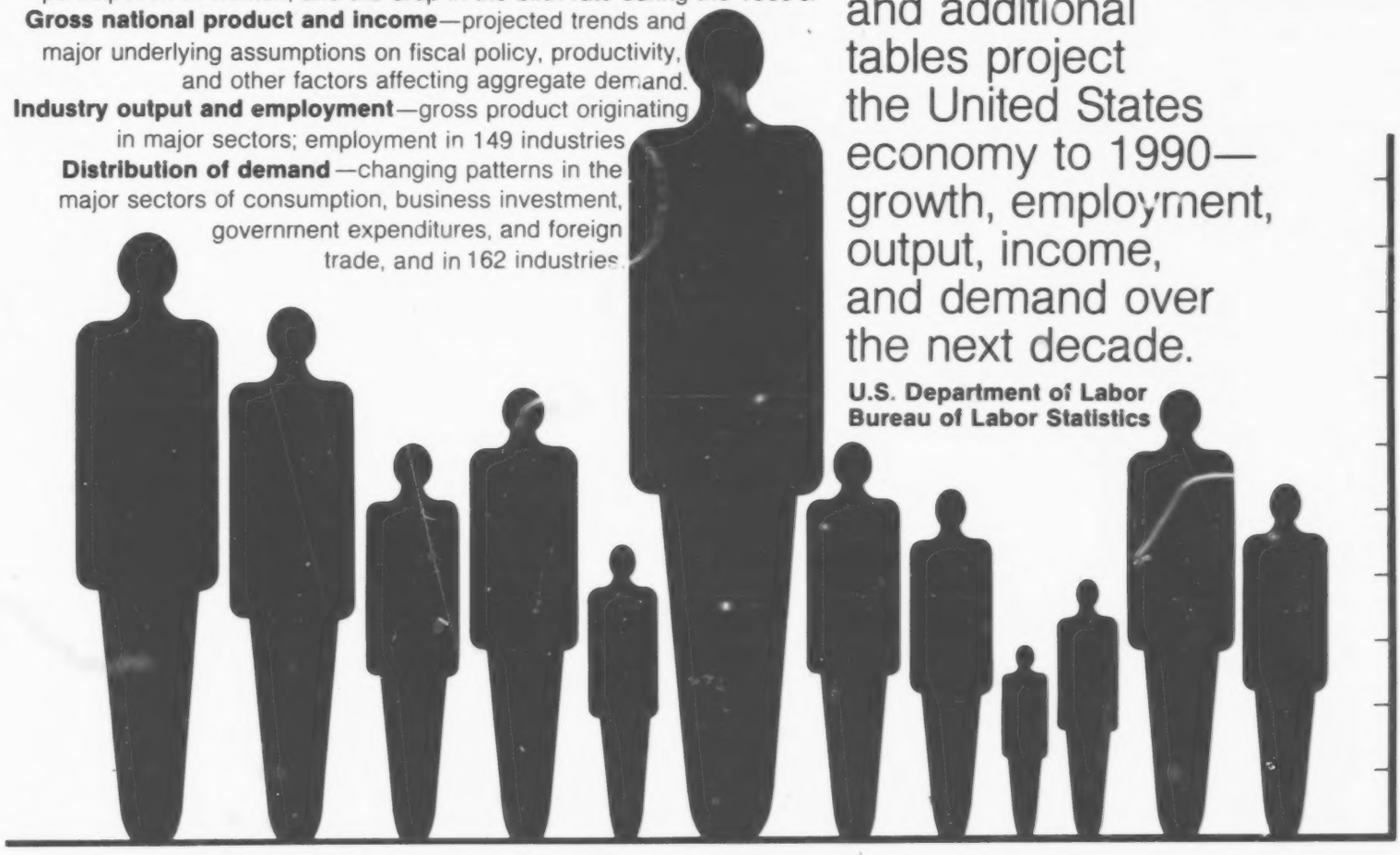
Gross national product and income—projected trends and major underlying assumptions on fiscal policy, productivity, and other factors affecting aggregate demand.

Industry output and employment—gross product originating in major sectors; employment in 149 industries.

Distribution of demand—changing patterns in the major sectors of consumption, business investment, government expenditures, and foreign trade, and in 162 industries.

Four articles from the *Monthly Labor Review* and additional tables project the United States economy to 1990—growth, employment, output, income, and demand over the next decade.

U.S. Department of Labor
Bureau of Labor Statistics



Order Form

Mail to BLS Regional Office nearest you (see listing elsewhere), or the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Please send _____ copies of **Employment Projections for the 1980's,** BLS Bulletin 2030 (Stock No. 029-001-02312-0) at $4 a copy (25 percent discount for orders of 100 copies or more sent to one address)

□ $ _____ Remittance enclosed. (Make checks payable to Superintendent of Documents.)
□ Charge $ _____ to my Deposit Account No. _____

Name—First, Last

Street address

City State Zip Code

(or County)

Please print or type

period establish families, they will require more housing and goods such as appliances. Changes in the size and characterisitcs of the population also affect the size and characteristics of the labor force—the people who work or are available to work.

The size and characteristics of the labor force determine the number and type of people competing for jobs in the various occupations. Because workers are a vital part of the production process, the size of the labor force is one of the limits on the amount of goods and services that can be produced.

Another key factor affecting occupational employment is change in employment in industries. If the demand for an industry's product increases in the future, more workers generally will be hired to increase production and employment in the industry will grow. There are exceptions to this rule. Changes in the technology used to make products or provide services often enable business firms to increase output without hiring more workers. Mechanized book binding, for example has limited job opportunities in binderies, although there are more books being bound now then ever before.

Changes in occupational employment will result from growth in the industries that employ workers. Precisely what effect changes in industry employment will have on a particular occupational depends on the occupational structure of the industries involved. Industries differ greatly in the types of workers they employ. Craft workers make up more than one-half of the construction industry's work force, but only a small fraction of employment in the finance, insurance, and real estate industry. Should the demand for new houses and office buildings rise, the number of craft workers needed in construction would rise also. In contrast, even if the demand for financial and insurance services skyrocketed, the impact on craft workers would be small. Because the construction industry is the larger of the two, an increase in demand would have a larger impact even on occupations which constitute a similar proportion of employment such as professional and technical workers.

"The development of industry projections starts with an estimate of what the economy can produce —gross national product— in the target year."

Changes in the occupational structure of industries also are a major determinant of occupational employment growth. Technological innovations in machines or production processes can cause employment in occupations to expand or contract and create a need for new occupations. The computer resulted in the emergence and rapid growth of employment of systems analysts, programmers, and computer operators, but contributed to the decline in relative importance of file clerks and other occupations. The effects of technological innovation may be limited to only one industry or may be widespread. Over the long run, the development of new products and processes has created some new industries while eliminating others.

Changes in business operations also can alter the occupational structure of industries. Despite the rising use of credit, the employment of credit managers declined because retail stores have centralized their operations. Supply-demand conditions in one occupation can also affect another occupation. When workers in a highly skilled or professional occupation are in short supply, employers may hire more assistants or technicians. Job restructuring, for example, enabled engineering technicians to be substituted for engineers during periods in the past such as the rapid development of the space program when certain types of engineers have been in short supply.

Methods Used To Project Growth

To estimate future occupational employment requirements, BLS analysts must first project total employment by industry as well as the occupational staffing patterns (ratios) by industry.

The development of industry projections starts with an estimate of what the economy can produce—gross national product (GNP)—in the target year. This is developed within a framework or system that offers a statistical description, not a forecast, of the economy. Underpinning the framework are projections, assumptions, and judgments that take into account such things as size and composition of the population and labor force, output per worker, and changes in hours of work. Policy targets concerning such factors as tax rates, unemployment, inflation, and the balance of trade and other assumptions also are formulated and used in the projection system. Considered as a whole, all these variables present a picture of the economic conditions assumed for the projections. Adjustments are made during the projection procedure to achieve levels of output and other variables consistent with the assumptions.

Potential GNP is disaggregated among its major components: Consumer expenditures, investment, government expenditures, and net exports. Each of these demand components is broken down by producing industry. For example, consumer expenditures are distributed among product groups, such as medical care or food purchased

for use at homes, while investment in producers' durable equipment is distributed by purchasing industry such as trucks, computers, or machine tools.

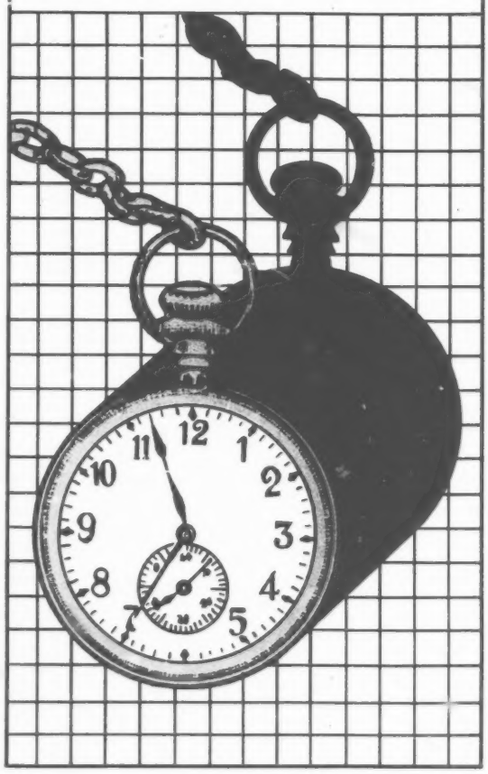
These product estimates are then translated into detailed projections of industry output, not only for the industries producing the final product—such as an automobile—but also for the industries that provide electric power, legal services, transportation, advertising, component parts, and other inputs required in the production process. Industry output requirements are in turn converted into industry employment requirements by using estimates of future output per workhour based on expected trends in productivity and technological developments for each industry.

Projections of industry employment are translated into occupational projections using an industry-occupation matrix. This matrix is a model representing the current and projected occupational staffing patterns of each industry. These data are set up to form a grid or table showing the proportion of each occupation to total employment in an industry. Cross-classified another way, the tabulation shows how total employment in an occupation is distributed by industry. The matrix currently depicts occupational skills in about 400 specific occupations and 200 industry sectors.

By applying the projected occupational structure for each industry to the industry employment projections and aggregating the resulting estimates for all industries, employment projections for each of the occupations contained in the matrix are obtained. Thus, the projected employment of an occupation is determined by changes in the proportion of workers in the occupation in each industry, and the growth rates of industries in which an occupation is concentrated. Employment in an occupation, for example, would be projected to grow (1) if its proportion of the work force increases but industry employment remains constant or (2) if its proportion of the work force remains constant but industry employment increases.

Employment requirements for many occupations, however, were projected independent of their relationships to industry employment. The projection of school teachers, for example, was based on an analysis of trends in pupil-teacher ratios and the projected school-age population. This technique is preferred in cases where reliable predictive relationships can be established.

"Replacement needs due to deaths and retirements, on the average, account for about twice as many openings as those from employment growth."



Job Openings

Projected size and change in employment are two indicators of future job prospects; another is the total number job openings expected in th occupation. The total includes job openings resulting from employment growth and the need to replace employees in an occupation who die, retire, transfer to another occupation, or simply stop working, perhaps to attend college or care for a family.

Replacement needs due to deaths and retirements, on average, account for about twice as many openings as those from employment growth. Although data are not available to estimate other replacement needs, research findings indicate occupational transfers and temporary labor force separations are a larger source of job openings than growth, deaths, and retirements combined.

The relationship of replacement needs to employment in an occupation is complex and not completely understood. Limited information indicates that some occupations will offer more job opportunities than their projected employment or growth rates would suggest.

Generally speaking, employees in occupations requiring the least training or experience have higher replacement needs than other occupations while occupations requiring the most training or experience tend to have the lowest replacement rates. Physicians, engineers, and bank managers, for example, have extensive training, and there are few occupations to which they could transfer without taking a cut in pay. On the other hand, retail sales clerks have lower pay and many change occupations each year to get higher pay.

Unfortunately, projected data about total replacement needs are not available. However, some of the patterns of the past are unlikely to change significantly: Occupations which require little training will provide more employment opportunities from replacement needs than occupations which require extensive training or experience.

Accuracy of the Projections

A lot of assumptions, judgments, as well as other projections go into the makeup of the job outlook projections—using a variety of models and analytical methods. They are consequently subject to a margin of error, particularly if actual conditions in the target year differ significantly from the conditions assumed for the projections.

How accurately have BLS projections anticipated future trends? Past evaluations—not surprisingly—estab-

that sounded so different could lead to the same goal. For example, some courses were based on the medical needs of the patients being helped, such as surgery or maternity patients. But the courses at other schools had much more general titles, such as "The Nurse and the Family" or "The Nurse and Society." Then Dave realized that something similar had happened in his English courses in high school. In some of those course, different types of literature, like poems or short stories, were read together; and, in others, the literature was read in chronological sequence. But no matter how differently the courses were organized, much of the day to day work—say the analysis of a particular story—and the final goal of the courses—an increased understanding of literature—were the same. Similarly, no matter how nursing courses are organized, the clinical experiences share a fundamental similarity.

Dave reached some understanding of what a sequence of nursing courses would be like by reading catalogs and talking to students and teachers at nursing schools. At one school that arranged its courses according to the needs of the patients, the first course was "an introduction to the concepts, theories, and skills basic to nursing," in the words of the school's catalog. In such a course, students learn things like how to bathe and feed a patient and how to change a dressing; they find out what goes on in the operating rooms, recovery rooms, and other parts of the hospital; and they begin to see how the hospital as a whole works. Most important, they start to learn how to assess, plan, and implement the kind of care given to all types of patients.

In their nursing courses, students work in rotation on all the services of the hospital, such as obstetrics, orthopedics, pediatrics, coronary care, intensive care, psychiatry, the emergency room, the operating room, and so forth. Depending on the school's program, students might also have clinical experiences in a nursing home, a community health center, or other facilities. Students are usually assigned one or more patients by their instructor before rotating from one service to another. The assignments are based on

what is to be learned. For example, one unit of a course might be the care of a patient with impaired mobility, perhaps due to a broken hip. The number of patients assigned depends on the amount of care each needs. One nurse can usually care for several healthy babies, but a single patient in an intensive care unit is a full-time responsibility.

Once students know who their patients are, they research their medical history and assess their nursing needs to learn what care is called for. Students then spend 3 to 8 hours a day caring for their patients, possibly for 3 days in a row. Time spent with patients is balanced by time spent in conference with the instructor and other students.

Nursing Right Away

Once Dave decided that he wanted to be a nurse primarily concerned with the care of the sick, he had to pick a school to attend. Diploma schools can not be found in every State, but there were a few in Dave's, and he chose to attend one. It had a good reputation and a dormitory, so he could live away from home. He mainly wanted to go to the Nightingale Hospital School of Nursing because of the clinical experience it offered. At Nightingale, Dave will work with his first patient within a few weeks of starting school. He wants to have some nursing right away because, although he's 90 percent sure that he wants to be a nurse, there is still that other 10 percent of doubt. As one nurse told him, "Reading about the job is one thing, caring for a dying patient is another."

Besides the amount of clinical experience it offers, Nightingale attracted Dave because it only educates nurses. The nursing students aren't just part of the student body; they are the whole of it. And since Nightingale is a very large hospital, it's school is able to provide just about all the clinical experience Dave needs right in the same group of buildings. At some other schools, especially those that are part of a community college, most of the clinical experience must be performed away from the school's campus under the supervision of the school's faculty.

Although, as an institution, Nightingale stresses nursing, Dave won't only study nursing. He will also take science courses—such as chemistry and microbiology—and health-related courses—such as nutrition pharmacology, and anatomy. To Dave, other courses—such as psychology, sociology, and English, seemed less obviously related to nursing, but they will help him understand and communicate with patients.

Dave will take all of his general education courses at a nearby college. In fact, he'll be a registered, full-time student at that college during his first year at Nightingale. He likes that idea because he'll be able to use the college facilities, go to the football games, and meet other students his age. Taking general education courses at or through an accredited college—either 2- or 4-year—is important for more than social reasons, however. If Dave decides to continue his education after he becomes an R.N., he'll have a much easier time transferring credits for his general education courses than he would if those courses were taught by Nightingale itself. That's why 93 percent of all diploma schools are now associated with other, academic institutions. Courses aren't always taught on another campus, but they are taught by instructors from the other school and meet that school's academic standards.

Being able to go back to school and earn a B.S.N. might turn out to be important to Dave if he decides he wants to become a public health nurse, a teacher of nursing, or a nurse practitioner. (A nurse practitioner has more independence when caring for patients than does an R.N.) But for now, Dave wants to be a staff nurse in a hospital, so he doesn't want to spend an extra year in school. And most of all, he wants the stress on clinical experience provided by Nightingale's program.

A Wider Field for Nursing Practice

When Pat Carroll thinks about careers, she's like a mountainclimber viewing the Alps; they all look good. Pat thinks more about being a nurse than anything else, because the ideals of nursing attract her, but she doesn't want to rule out jobs in the sciences and engineering—at least not as soon as she gets out of high school. So she decided to go to West State University, which grants a B.S.N. During her first 2 years at school, she'll be a student in the general college. Only in her last 2 years will she take nursing courses; and, even then, she'll be taking general education courses too. Going to this school will give Pat time to choose, because, even though she will declare her major when she enters, she will have a much easier time transfering from one division of the university to another than she would if she went to another school.

Afer receiving her B.S.N. degree, Pat will have somewhat more choice of jobs than do R.N.'s prepared in other programs. Some people she spoke with claimed she'd also have a better chance at being promoted, but Pat couldn't find any proof that that was the case. She did learn, however, that instead of being a staff nurse, she could work as a visiting nurse for a public health agency. She could also continue her education and become a teacher of a clinical specialist. Graduates of diploma and A.D. programs can return to school, earn a B.S.N., and then go on to graduate school; but only graduates of baccalaureate nursing schools can go right into a master's program. Pat also felt that she could more easily spare additional time at school now than she could if she were working and supporting herseif. In order to go back to school later, she might have to give up a job or move to another city. And the total time spent in school would be longer if she first earned an A.D. or a diploma and then enrolled in a B.S.N. program. Pat also spoke to some nurses who had returned to school and found being a student again very frustrating. For one thing, they had to take general education courses such as Pat would take in her freshman and sophomore years. Furthermore, some of them felt that they didn't receive as much credit as they deserved for their previous education and experience.

While looking into various baccalaureate nursing schools, Pat discovered that the programs differed quite a bit from one another. A few schools that grant B.S.N. degrees begin the nursing courses right away, just as many of the diploma and associate degree programs do, and some take 5 years to complete, although most take 4. The way the nursing courses are organized also differs. At many schools,

demand or the number of workers needed; occupational supply or the number of people available for work in a specific occupation or group of occupations; occupational characteristics or the duties of the worker, working conditions, education and training requirements, earnings, and similar information; and complementary information such as the educational and training programs available, their location, and sources of financial assistance.

The *OIS Handbook,* now being developed, will provide far more comprehensive and detailed guidance. It is a joint project, funded by NOICC, of the North Carolina, South Carolina, and Colorado SOICC's. The *Handbook* will identify the kinds of information current and potential users of an OIS need, including administrators of education and training programs, career counselors, and those making career decisions. With this end in view, State user needs assessments are being reviewed and summarized, representatives of Federal agencies and national organizations that use this information are being interviewed, experts on the use of occupational information are studying the need for this information, and the literature on the subject is being reviewed.

The *Handbook* will contain a detailed, technical description and sources of data for each of the four elements of an OIS, as well procedures for using each element in the development of a system and alternative ways to operate it. Training materials will be developed and a workshop held to assist SOICC's in using the *Handbook* and to prepare SOICC staff to conduct similar training sessions in the States.

To a great extent, NOICC's activities have focused on correlating the occupational and educational classification systems upon which the projections of demand and supply depend. Currently, several different systems exist, each of which was designed to meet the particular needs of the agency collecting the data rather than the needs of planners, counselors, and job seekers. Rarely are the systems directly compatable. These systems must be related for them to be used in a standardized manner in the OIS. *Vocational Preparation and Occupations,* the product of a NOICC sponsored project, takes a long step in this direction. It cross-codes the instructional program codes used in vocational education with the systems used in the *Dictionary of Occupational Titles,* the 1970 Census, the Occupational Employment Statistics program of the Department of Labor, and the *Standard Occupational Classification Manual.* In addition, job analysis information gathered for the fourth edition of the *Dictionary of Occupational Titles* is included, providing information on the educational, training, and physical requirements of an occupation, working conditions, and the industries in which it is found.

Two of the systems included in *Vocational Preparation and Occupations* are now undergoing major revision. Because of the importance of the cross codes to understanding and use of information in the OIS, NOICC has provided extensive technical assistance in the revision of the *Standard Occupational Classification Manual* and the education program classification. Furthermore, important contributions to the development of *Vocational Preparation and Occupations* have been, or will be, made by the Employment and Training Administration—including the Occupational Analysis Field Centers of the U.S. Employment Service—the National Center for Education Statistics, the Office of Federal Statistical Policy and Standards, the Office of Vocational and Adult Education, and the Bureau of Labor Statistics.

The next edition of *Vocational Preparation and Occupations* will be available late in 1980; a subsequent edition comprising all the revisions currently contemplated including the 1980 census is scheduled for completion in 1981.

In implementing an OIS at the State level, the SOICC's face a dual requirement: They are supporting the development and implementation of an OIS, as well as promoting the awareness and use of information currently available. Thus, even while they are addressing issues regarding the general development of an OIS, many State Committees are also beginning to operate one. The following is a rundown of the activities the SOICC's have initiated in regard to the development and implementation of an OIS:

- In 1979, eighteen SOICC's conducted surveys, workshops, or conferences designed to identify the types of occupational information desired by users and its importance to them. At least 21 SOICC's completed or planned to conduct user needs assessments in 1980.
- Six SOICC's inventoried the sources of occupational data within their States during 1979. Nineteen SOICC's planned similar inventories in 1980. These projects allow the SOICC's to help agencies and organizations avoid duplication and to help users find the data available.
- Fifteen SOICC's plan to conduct feasibility studies in 1980 that will enable them to determine the status of occupational information and information reporting systems in their States and to determine the most appropriate way to operate their OIS.

• Forty-nine of the 57 SOICC's were preparing a general design for an OIS in 1980.

How a State operates its OIS is a decision made by the State Committees so it can be done in a manner fitting the conditions within the State. The State Committees have chosen a variety of ways to do this. SOICC staffs in several States serve as clearinghouses, referring inquiries to the sources of specific occupational information within their States. On the other hand, the Alabama SOICC houses a computerized system that also is capable of producing publications. The Nevada SOICC uses the State's library system to disseminate information.

In addition, the SOICC's are involved in projects to improve the availability and reliability of the data contained in the OIS, particularly the estimates of current and projected occupational demand and supply. For example, several SOICC's are supporting their State's Employment Security Agency for the development of current employment estimates and projections for specific occupations for areas smaller than the State. Others are assisting in follow-up surveys on persons who have completed or left vocational or job training programs. The Oklahoma SOICC is studying the feasibility of compiling student follow-up data from employment security records rather than conducting special surveys. The Massachusetts SOICC is compiling standardized data on CETA participants to identify the extent to which participants are counted more than once because they are included in more than one reporting system used to develop supply estimates. And, to improve the usefulness of the information on occupational characteristics, the Florida SOICC is sponsoring a project to define job tasks in a variety of occupations in terms of physical demands. When combined with measurements of an individuals's capabilities, this information will enable handicapped persons or counselors to evaluate the possibility for success in an occupation realistically.

Delivering Career Information

Efforts on the part of NOICC to develop delivery systems for career information grew out of a program initiated by the U.S. Department of Labor in 1974. The goal of the programs is to develop Career Information Delivery Systems (CIDS's) that will provide current, accurate, and locally relevant occupational information to all possible users. In November 1979, NOICC awarded grants to 15 States to develop CIDS's over a 2-year period. Added to the 9 States that had participated in the original Department of Labor program, this raises the total of States operating CIDS's to 24. Another 17 States have expressed interest in initiating a CIDS and several have started without direct support from NOICC.

Each CIDS is to operate throughout a State. In addition to national data, each is to incorporate information for that State and smaller areas within the State. Information about neighboring States might also be provided. The primary source of the information is, of course, the State OIS. Each SOICC is directly responsible for the accuracy of the information offered by its CIDS.

The CIDS's are intended to be tools counselors can use in conjunction with traditional methods to improve the information and guidance received by their students or clients. A CIDS may use various media, depending on a State's needs and capabilities. For example, a CIDS might provide information through filmstrips and cassettes, microfice, and more traditional publications like pamphlets and flyers, as well as on-line computer terminals.

NOICC requires that each CIDS deliver occupational information to the widest possible range of users. Therefore, high schools, colleges, correctional institutions, vocational and technical schools, libraries, and vocational rehabilitation centers might all provide people in the State with access to the CIDS. NOICC has also funded some special projects related to the delivery and use of career information. One project, for example, provides intensive labor market and job search information to inner-city, black youth. Those working on the project have designed a curriculum that encompasses occupational and labor market information, career interests, current skills, and job-seeking skills. The project also developed testing procedures, measurements of outcomes, and a plan for analyzing the project's results. The curriculum is currently being implemented in two Philadelphia schools.

NOICC is also funding a study by the National Institute of Education to evaluate the effectiveness of delivery systems in improving career awareness. The study's first phase will determine, through a national survey of career information sources in secondary schools, what career information is now being delivered to secondary school students and how it is being delivered. Survey returns are being analyzed at his time. The second phase will consist of on-site visits to interview persons working with different types of CIDS and determine the effectiveness of alternative systems. The study is scheduled for completion in 1981.

The underlying theme of NOICC/SOICC activities is improving the match between people and jobs. In carrying out the legislative mandates, NOICC and the State

Committees can best be described as facilitators.

Coordinating the scores of agencies and program offices in the Federal and State governments that produce and use the occupational information, including career information, people need is no easy task. But it is a task that Congress saw a need for. And it is the task that NOICC and the SOICC's will perform.

Questions about NOICC should be directed to

Russell B. Flanders, Executive Director
National Occupational Information Coordinating Committee
Riviere Building, Room 801
1832 M St. NW.
Washington, D.C. 20036.

Because each State is at a different stage in implementing an OIS and the accompanying CIDS and because research efforts differ, questions about State programs should be directed to the individual SOICC's. A list of the SOICC directors and their addresses appears on the next two pages.

SOICC Directors

Alabama
Dr. Mary Louise Simms, Director
Alabama Occupational Information Coordinating Committee
State Department of Education
First Southern Towers, Suite 402
Montgomery, Alabama 36130
(205) 832-5737

Alaska
Mr. Welles Gabier, Coordinator
Alaska Occupational Information Coordinating Committee
Pouch F—State Office Building
Juneau, Alaska 99811
(907) 465-2980

American Samoa
Mr. Sanele Tuiteleleapaga, SOICC Director for Vocational Education
Department of Education
Government of American Samoa
Pago Pago, American Samoa 96799

Arizona
Mr. Stan Butterworth, Executive Director
Arizona State Occupational Information Coordinating Committee
1535 West Jefferson, Room 345
Phoenix, Arizona 85007
(602) 255-3680

Arkansas
Mr. Coy Cozart, Director
Arkansas State Occupational Information Coordinating Committee
Post Office Box 5162
Little Rock, Arkansas 72205
(501) 371-3551

California
Mrs. Lorine Auginbaugh
Acting Executive Director
California Occupational Information Coordinating Committee
800 Capitol Mall
MIC #57
Sacramento, California 95814
(916) 322-8882

Colorado
Mr. Warren W. Wolff, Director
Office of Occupational Information
Colorado Occupational Information Coordinating Committee
770 Grant, Room 222
Denver, Colorado 80203
(303) 839-3165

Connecticut
Mr. Gary E. King, Executive Director
Connecticut State Occupational Information Coordinating Committee
Hartranft Hall
55 Elizabeth Street
Hartford, Connecticut 06053
(203) 566-5246

Delaware
Mr. Christopher D. Lyons, Director
State Occupational Information Coordinating Committee
3 Peddler's Row
Christiana, Delaware 19702
(302) 368-6772

District of Columbia
Dr. Wendell P. Russell, Executive Director
District of Columbia Occupational Information Coordinating Committee
500 C Street NW., Suite 621
Washington, D.C. 20001
(202) 724-3965

Florida
Ms. Eleanor Morgenthau, Director
Florida Occupational Information Coordinating Committee
325 John Knox Road, Suite L-500
Tallahassee, Florida 32303
(904) 386-6111

Georgia
Mr. Clifford L. Granger, Executive Director
State Occupational Information Coordinating Committee
151 Ellis Street NE., Suite 504
Atlanta, Georgia 30303
(404) 656-3117

Guam
Mr. Jose S. Mantanona, Acting Executive Director
Guam Occupational Information Coordinating Committee
Post Office Box 2817
Agana, Guam 96910
(671) 477-8941

Hawaii
Mr. Patrick A. Stanley, Executive Director
Hawaii State Occupational Information Coordinating Committee
1164 Bishop Street, Suite 502
Honolulu, Hawaii 968813
(808) 548-3496

Idaho
Mr. Charles R. Mollerup, Coordinator
State Occupational Information Coordinating Committee
Len B. Jordan Building
650 West State Street
Boise, Idaho 83720
(208) 334-3705

Illinois
Mr. Jan Staggs, Executive Director
Illinois Occupational Information Coordinating Committee
623 East Adams Street
Post Office Box 1587
Springfield, Illinois 62705
(217) 785-0789

Indiana
Mr. Theodore N. Popoff, Director
Indiana Occupational Information Coordinating Committee
17 West Market Street
434 Illinois Building
Indianapolis, Indiana 46204
(317) 232-3625 or 3626

Iowa
Mr. John Niemeyer, Executive Director
Iowa State Occupational Information Coordinating Committee
523 East 12th Street
Des Moines, Iowa 50319
(515) 281-8076

Kansas
Mr. Randall Williams, Director
Kansas Occupational Information Coordinating Committee
634 South Harrison, Suite C
Topeka, Kansas 66603
(913) 296-5286

Kentucky
Mr. Don C. Sullivan, Coordinator
Kentucky Occupational Information Coordinating Committee
601 Versailles Road
Frankfort, Kentucky 40601
(502) 564-4258

Louisiana
Mr. Wallace L. Wagner, Director
Louisiana State Occupational Information Coordinating Committee
Post Office Box 44094
Baton Rouge, Louisiana 70804
(504) 342-3267

Maine
Mr. Gerard Bilodeau, Executive Director
State Occupational Information Coordinating Committee
State House Station 71
Augusta, Maine 04330
(207) 289-2331

Maryland
Ms. Alison Witow, Executive Director
Maryland Occupational Information Coordinating Committee
Department of Human Resources
1100 North Eutaw
Baltimore, Maryland 21201
(301) 383-$650

Massachusetts
Mr. Stuart I. Tischler, Executive Director
Massachusetts Occupational Information Coordinating Committee
Park Square Building, Suite 341
31 St. James Avenue
Boston, Massachusetts 02116
(617) 727-9740

Michigan
Mr. Robert Scherer
Acting Executive Coordinator
Michigan Occupational Information Coordinating Committee
309 North Washington
Post Office Box 30015
Lansing, Michigan 48909
(517) 373-0363

Minnesota
Mr. John Cosgrove, SOICC Director
Department of Economic Security
690 American Center Building
150 East Kellog Boulevard
St. Paul, Minnesota 55101
(612) 296-2072

Mississippi
Mr. William Caston, SOICC Director
Vocational Technical Education
Post Office Box 771
Jackson, Mississippi 39205
(601) 354-6779

Missouri
Ms. Kay Raithel, Director
Missouri Occupational Information Coordinating Committee
830 d East High Street
Jefferson City, Missouri 65101
(314) 751-2624

Montana
Ms. Susan Bartlett, Program Manager
Montana State Occupational Information Coordinating Committee
Post Office Box 1728
Helena, Montana 59601
(406) 449-2741

Nebraska
Ms. Donita Thompson, Executive Director
State Occupational Information Coordinating Committee
W. 300 Nebraska Hall
University of Nebraska
Lincoln, Nebraska 68588
(402) 472-2062

Nevada
Ms. Doris P. Palazzolo, Director
State Occupational Information Coordinating Committee
Capitol Complex
505 East King Street
Kinkead Building, Room 603
Carson City, Nevada 89710
(702) 885-4577

New Hampshire
Mr. Ralph W. Beckley, SOICC Director
Department of Employment Security
32 South Main Street
Concord, New Hampshire 03301
(603) 224-3311

New Jersey
Ms. Sandra Streeter, Acting Staff Director
New Jersey Occupational Information Coordinating Committee
Department of Labor and Industry
Division of Planning and Research
Post Office Box 2765
Trenton, New Jersey 08625
(609) 292-2626

New Mexico
Dr. Charles Epler, Director
New Mexico State Occupational Information Coordinating Committee
Executive Plaza
4135-B Montgomery Blvd. NE.
Albuquerque, New Mexico 87125
(505) 842-3913

New York
Mr. Albert Ross, SOICC Director
State Department of Labor
Labor Department Building #12
State Campus
Albany, New York 12240
(518) 457-2930

North Carolina
Ms. Joyce Kinnison, SOICC Director
North Carolina Department of Administration
112 West Lane St.
218 Howard Building
Raleigh, North Carolina
(919) 733-6700

North Dakota
Mr. Daniel Marrs, Director
State Occupational Information Coordinating Committee
1424 West Century Avenue
Post Office Box 1537
Bismarck, North Dakota 58501
(701) 224-2733

Northern Mariana Islands
Mr. Alvaro A. Santos, Exec. Director
Northern Mariana Islands Occupational Information Coordinating Committee
Post Office Box 149
Saipan, Northern Mariana Islands 96950
Telephone: 7136

Ohio
Mr. Mark Schaff, Director
Ohio Occupational Information Coordinating Committee
State Department Building
S-65 South Front Street, Room 904
Columbus, Ohio 43215
(614) 466-2095

Oklahoma
Dr. J. B. Morton, Executive Director
State Occupational Information Coordinating Committee
School of Occupational and Adult Education
Oklahoma State University
1515 West 6th Street
Stillwater, Oklahoma 74074
(405) 377-2000, ext. 311

Oregon
Dr. David H. Fretwell, Executive Secretary
Oregon Occupational Information Coordinating Committee
875 Union Street NE.
Salem, Oregon 97311
(503) 378-8146

Pennsylvania
Mr. Robert Bedi, Director
Pennsylvania Occupational Information Coordinating Committee
Labor and Industry Building
7th and Foster Street, Room 1008
Harrisburg, Pennsylvania 17121
(717) 787-3467

Puerto Rico
Ms. Carmen Doris Diaz, Executive Director
Puerto Rico Occupational Information Coordinating Committee
Prudencio Rivera Martinez Building
505 Munoz Rivera Avenue
Hato Rey, Puerto Rico 00918
(809) 754-2161

Rhode Island
Ms. Mildred T. Nichols, Executive Director
Rhode Island Occupational Information Coordinating Committee
22 Hayes Street, Room 315
Providence, Rhode Island 02908
(401) 272-0830

South Carolina
Ms. Carol Kososki, Director
South Carolina Occupational Information Coordinating Committee
1550 Gadsden Street
Columbia, South Carolina 29202
(803) 758-3165

South Dakota
Mr. Vern Bak, Executive Director
South Dakota Occupational Information Coordinating Committee
108 East Missouri
Pierre, South Dakota 57501
(605) 773-3935

Tennessee
Dr. Kermit Bowling, Director
Tennessee Occupational Information Coordinating Committee
512 Cordell Hull Building
Nashville, Tennessee 37219
(615) 741-6451

Texas
Mr. Edmund F. Ney, Executive Director
State Occupational Information Coordinating Committee
Texas Employment Commission Building
15th and Congress, Room 648
Austin, Texas 78778
(512) 397-4970

Trust Territory
Mr. Michael Dean Rody, Chairman
Trust Territory of the Pacific Islands
Occupational Information Coordinating Committee
Office of Planning and Statistics
Saipan, Mariana Island 96950

Utah
Mr. Richard A. Brown, Director
Occupational Information Coordinating Committee
660 South 200 East, Suite 304
Salt Lake City, Utah 84111
(801) 533-5991

Vermont
Dr. Victor P. Racicot, Director
Vermont Occupational Information Coordinating Committee
Post Office Box 488
Montpelier, Vermont 05602
(802) 229-0311

Virginia
Mr. Jeffrey Windom, SOICC Director
Vocational and Adult Education
Department of Education
Post Office Box 6Q
Richmond, Virginia 23216
(804) 786-3281

Virgin Islands
Mr. Melvin Testamark, Director
Virgin Islands Occupational Information Coordinating Committee
Department of Education
P.O. Box 630
Charlotte Amalie
St. Thomas, Virgin Islands 00801

Washington
Mr. A. T. Woodhouse, SOICC Director
Commission for Vocational Education
Building 17, Airdustrial Park
Mail Stop LS—10
Olympia, Washington, 98504
(206) 754-1552

West Virginia
Dr. Rex J. Clay, Executive Director
West Virginia State Occupational Information Coordinating Committee
1600 ½ Washington Street, East
Charleston, West Virginia 25305
(304) 348-3784

Wisconsin
Dr. Shelly Cary, Director
Wisconsin Occupational Information Coordinating Committee
Educational Sciences Building, Room 952
1025 West Johnson
Madison, Wisconsin 53706
(608) 263-1048

Wyoming
Dr. Martin D. Singkofer, Director
Wyoming Occupational Information Coordinating Committee
Hathaway Building
2300 Capitol Avenue
Cheyenne, Wyoming 82002
(307) 777-7177-78

Grab Bag

Movin' On - Part I: Separation Rates

The Bureau of Labor Statistics has recently revised its estimates of the labor force separation rate in many occupations. These rates represent the number of workers per 1,000 who leave the occupation and the labor force each year because of retirement, illness, family responsibilities, death, or other reasons. The new 1970 rates are lower than the old ones were in most cases. In most occupations, however, the rate is projected to be higher in 1985 than it was in 1970. A detailed report on the new rates appears in the March 1980 issue of the Monthly Labor Review, but here are some occupations in which the 1985 rate is much higher than the 1970 one.

Occupation	Separation rate per 1,000 workers 1970 estimate	1985 projection	Occupation	Separation rate per 1,000 workers 1970 estimate	1985 projection
Engineers, civil	20.2	28.7	Farm implement mechanincs	22.4	32.6
Engineers, mining	24.2	36.2	Jewelers and watchmakers	38.3	58.3
Chiropractors	42.7	64.6	Motion picture projectionists	44.5	74.0
Dentists	11.5	18.6	Opticians, lens grinders, polishers	22.3	30.1
Optometrists	31.9	49.4	Sign painters and letterers	34.6	51.8
Pharmacists	35.4	53.5	Parking attendants	35.3	59.5
Podiatrists	38.2	54.4	Taxicab drivers chauffeurs	31.5	46.9
Veterinarians	17.4	25.2	Guards	48.3	76.3
Embalmers	20.3	30.8	Marshals and constables	44.0	71.6
Clergy	31.9	49.3	Sheriffs and bailiffs	29.2	44.5
Lawyers	32.1	49.7	Carpenters, helpers	16.2	23.1
Buyers, shippers of farm products	34.4	52.5	Gardeners, groundskeepers, except farm	38.1	61.6
Construction inspectors, public administration	38.5	57.4	Farmers (owners and tenants)	47.4	75.0
Advertising agents, salesworkers	24.6	34.6			
Auctioneers	35.4	53.9			
Real estate appraisers	35.0	55.3			
Paperhangers	42.7	61.5			
Blacksmiths	42.0	67.0			

Movin' On - Part II: Occupational Mobility

Of course not everyone who leaves an occupation is leaving the labor force; many people leave one occupation to go into another. The rate at which this is going on is also going up, according to Occupational Mobility During 1977, Special Labor Force Report 231, which is available from the regional offices of the Bureau of Labor Statistics listed on the inside front cover of this magazine.

The report notes that about 11.6 percent of the people surveyed were working at a different occupation in January 1978 than in January 1977. A similar survey in 1965 showed a mobility rate of only 8.7 percent. Occupational mobility, in 1977 and earlier, decreased sharply as the worker's age increased. It also varied by education, tending to be highest for those who attended but did not graduate from college.

There was little mobility between blue collar and white collar groups, workers being more likely to change occupation within one of these major categories than to go from one to the other. Among the occupations, the rate was especially high for operatives and nonfarm laborers. On the other hand, professional, technical, and kindred workers had a mobility rate of less than 9 percent, and male farmers and farm managers had a rate of less than 3 percent.

Movin' On - Part III: Job Tenure

People are not only changing occupations more, as indicated in the report described above, they're also changing employers at a high rate. About 30 percent of the 91 million Americans employed in January 1978 had found their job during the previous 12 months, according to Job Tenure Declines as Work Force Changes, Special Labor Force Report 235, which is also available from the regional offices of the Bureau of Labor Statistics whose addresses appear on the inside front cover of this magazine. Job tenure is the length of time an employee has worked steadily for the same employer. In 1978, median job tenure was 3.6 years, a slight decline from the 3.8 years of 1968.

Movin' On - Part IV: So?

All this turnover, whether caused by people leaving the labor force, changing their careers, or changing their employers, effects the condition of the labor force market. Labor force separations are especially important to people entering the labor force because it gives rise to the majority of openings in almost all occupations. Career changing also effects new job seekers, though not always favorably. The models of the economy that are used to project the number of openings in an occupation do not allow for occupational mobility.. This means that the models understate the number of openings available in occupations that career changers leave and overstate the number of positions available in occupations that career changers enter. Job changing has no effect on the number of workers employed in an occupation, but it does increase the number of positions available at any given time. Unfortunately for new workers, it also increases the number of experienced people who are looking for work.

FLASH FLASH FLASH

This word just in from our printer. Reprints from the 1980-81 edition of the Occupational Outlook Handbook are now available. Individual occupational and industry statements are available in 42 different reprints. A list of the reprint numbers appears at the back of the Handbook. Information is also available from the regional offices of the Bureau of Labor Statistics.

"You're a **What**?"

Jess Peters says that he is often called a "numismanut" by his friends. But his real profession, numismatics, really makes him a numismatist, or coin dealer. These experts buy and sell coins most commonly, but some also deal in paper money, tokens, or medals. Many specialize not only in one of these categories, but in even smaller subgroups of them. For example, some numismatists specialize in United States coins of a certain period, while others may specialize in foreign coins, ancient coins, or rare coins. And there are even coin dealers who are numismatic error dealers, specialists in coins that have mistakes on them.

There probably is no typical numismatist, although many fall into the category of small businessowners such as Jess Peters started out as. Most numismatists begin their careers in their youth (although they may not know it at the time) when they take an interest in coins and begin collecting and learning about them. It is usually after many years of diligent study and serious collecting that the idea occurs to the mature numismatist to make a beloved hobby—a profession. They enter tentatively, making sales and trading, while maintaining another job and eventually convert to full-time when they see they can make a "go" of it and open up a shop. Others, however, never do settle-down to a shopkeepers existence and instead remain "vest pocket" numismatists. Since the wares of the numismatist are highly portable, these vest-pocket numismatists deal by mail-order, getting their business chiefly by placing ads in numismatic newpapers and magazines. They also attend coin shows—about 40 to 50 per year—as do the shop owner numismatists, to buy, sell, and trade. Business is so brisk though, say some insiders, that many numismatists go just to buy for their steady clientele who provide constant demands on their stock.

Numismatists can be found in many places and doing many things: Some work for large numismatic companies as dealers or as catalogers, some are numismatic advisors, and others work in department stores manning the numismatic department. They work for auction houses and as authenicators, and still others work in numismatic publishing as writers, editors, or publishers. Recently, numismatic investment companies have sprung up, opening up yet another branch of this fascinating and varied field.

No exact figures are available on the number of persons who make their living working full-time in numismatics. Says Laurese Katen, president of the Washington Metropolitan Numismatic Association, Inc. and co-owner of a coin and numismatic book business: "Back in 1940 when we began, there were probably not more than 100 full-time dealers in the United States, but now there are thousands." Allen Harriman, publisher of the Coin Dealer Newsletter reports that the number of full-time and part-time dealers combined is around 10,000. Likewise, no definitive salary information is available for professional numismatists. Those who work for large companies work for a salary plus commission, as do probably most numismatists who work for department stores or auction houses. Shopowners salaries vary with their type of business, shop location, and clientele. Said one co-owner of a shop dealing in ancient coins, "Before I became a full-time numismatist, I was chairman of the Math department at a local university. I decided to change careers when I found out that I could make a lot of money at this."

More than a few professional numismatists start out by buying and selling coins in their college days for extra income. Marc Emory began this way, and found a job after graduation from the University of Pennsylvania (with a B.A. in Spanish and minors in Rus-

"You're a What? Numismatist" was written by OOQ staffwriter Gail M. Martin.

sian and Swedish) with New England Rare Coin Auctions. Marc cites the qualities necessary for a numismatist in his position. He says, "You must be fairly easy going and like to deal with the public." He says that his company looks for bright people and prefers college educated persons who have a very good knowledge of American or foreign coins, and a good instinct when it come to spotting value in coins. He says, "Coins don't have specific value—each coin is worth what you can get for it. There are catalogs with indicative values, but we are rare coin dealers and often deal with one-of-a-kind items."

Even though Marc works for one of the largest coin dealers in the country—his job entails working independently, much like many of the shop owner numismatists. He is the sole representative in his company's overseas division. From his base in West Germany he travels wherever he needs to in Europe to make a good purchase. Besides being stable, Marc stresses the importance of being able to make quick decisions and readily admit mistakes. "If you buy enough coins to be successful—you will make mistakes," he says. For example, his biggest blunder cost the company $25,000; it was the loss his company took on a rare coin for which Marc paid $235,000. His most successful transaction, on the other hand, was buying a coin for $275,000 which the company sold for $1.7 million!

Jess Peters cites similar qualities as important for the aspiring numismatist. He says, "You should have a good memory as well as a pleasing personality. A background or training in sales helps—I know my sales training helped me. You must also have patience for detail work—since much detail work is involved in numismatics."

Another crucial quality for some numismatists is initiative. Marc Emory reports most of the retail sales numismatists in his company search out the company inventory lists for coins that might be of interest to their customers. Then the salesperson calls up the customer to set up a transaction. Initiative is also important for the salesperson who deals with investors and investment companies. Again, the numismatist selects coins from the inventory that he or she thinks the investors may be interested in. Upon making the sale, the salesperson writes up descriptions of the coin for the investment account. The wholesale division numismatists work on sales of items to other dealers much in the same fashion.

Most successful numismatists agree upon the first steps to turning "pro." They all say the numismatist must first acquire extensive knowledge of coins, accumulate a stock of coins, and become an active member of a coin club. Coin clubs provide the opportunity to meet other collectors and dealers and hear professionals lecture on various topics of interest to numismatists. Beyond those steps, professional numismatists recommend acquiring a library on numismatics for study and reference. Says Laurese Katen, "Buy the book, before the coin." Jess Peters also emphasizes the importance of books: "I probably have 600 volumes and could use another 500 if they were available." Many numismatists do avail themselves of the libraries of the American Numismatic Association (ANA) in Colorado and the American Numismatic Society (ANS) in New York."

Beyond diligent study and acquiring a library, Mrs. Katen also recommends visiting coin museums or the numismatic collections in large museums such as in the Smithsonian Institution's museum. Newspapers, magazines and newsletters in the numismatic field are also helpful. Coin shows are also educational and frequently are open to public as well as dealers.

Both numismatic associations—the ANA and ANS—offer educational programs to their members. A few colleges offer accredited courses in numismatics—Adelphi University, for example, is one that has several courses. Home study courses are another source some numismatists have used to gain information.

But, do numismatists think the numismatic profession is minted in heaven? Not necessarily, they say. Among the disadvantages are exactly what makes numismatics interesting: The portability and attractiveness of the wares. These qualities make numismatics the target of counterfeiters and theives. Insurance on their stock is often prohibitively costly, numismatists report. It sometimes costs amounts equal to the value of the coins themselves. Although the American Numismatic Association has a hotline to report forgeries and thefts, often numismatic losses are never recovered—as in the case of former Secretary of the Treasury John W. Snyder's historic private collection of coins from each president's era, which he had donated to the Harry S Truman Library in Independence, Missouri. No trace of it was ever discovered after being stolen from the Truman Library.

On the other hand, Jess Peters points out a big attraction to the field for himself besides his love and devotion to numismatics—the people. He says, "One of the finest aspects of my profession is the people I've had the opportunity to meet and deal with over the years. My customers are very fine people. Like any other profession—if you thoroughly enjoy it, it's more than your profession—it's a pleasure."

Other numismatists would hasten to agree with Jess. For as Charles Hoskins, chief authenticator for the International Numismatic Society reveals, the pleasure of numismatics, on many levels, is sometimes just too much. He cites a continuing problem of many numismatists: "They often become quite attached to their inventory—they fall in love with a coin and will not sell it."

Certainly such attachment may be seen as a detriment, but only by those uninitated who fail to understand Jess Peter's description of the field. A British friend of his once remarked upon hearing of the going price at an auction for a coin, "My God, $24,000 for a spot of rust!" Jess Peters would say, "It's not much for an item of such unfading beauty and unfailing value."

For information on membership, readers may wish to write to the following organizations:

American Numismatic Association
P.O. Box 2366
Colorado Springs, Co. 80901

American Numismatic Society
Broadway & 155th Street
New York, N.Y. 10032.

Counseling Aids

Hire More Workers, Pay Less Taxes, describes a program that can help the disadvantaged find jobs. It explains that the Revenue Act of 1978 gives an employer a tax credit of as much as half of the first $6,000 in wages paid qualified workers during their first full year on the job, and as much as one fourth of the first $6,000 in wages paid such workers in the second year of employment. Qualified workers include recipients of Supplemental Security Income (SSI), some persons who have received general assistance, and some ex-offenders. All private employers in a trade or business can take advantage of the tax credit. The 8-page booklet is free from the U.S. Department of Labor, Employment and Training Administration, Washington, D.C. 20213.

Affirmative Action To Employ Mentally Retarded People: A Pocket Guide, describes two programs under which the employment of retarded people is covered. Under Section 503 of the Rehabilitation Act of 1973 every employer doing business with the Federal Government under a contract for more than $2,500 must take "affirmative action" to hire handicapped people, among them retarded. Under Section 504, every organization in the United States getting any sort of Federal financial assistance must take steps to assure that handicapped people (mentally retarded included) are not discriminated against. This 20-page booklet explains who's handicapped, what affirmative action consists of, and how to file complaints. Free from the President's Committee on Employment of the Handicapped, Washington, D.C. 20210.

Know Your Pension Plan, 16 pages, is a checklist for those who are covered by a pension plan or are considering joining such a plan. It helps you determine what your pension plan provides. It also tells about some of the provisions of the Employee Retirement Income Security Act of 1974 (ERISA). ERISA generally provides certain rights and protections for those covered by a private pension plan. Some of the important points covered in this booklet are: Types of benefits, age and service requirements for each type of benefit, how your service is counted, how service can be discounted, how you can lose benefits, how your benefits are vested, and how to apply for benefits. Available free from the Department of Labor, Labor-Management Services Administration, Washington, D.C. 20216.

Your Guide to Job Corps is an 14-page booklet describing eligibility, pay and benefits, training and education, rules, regulations, and responsibilities, center life, and concluding with "Job Corps and You," which explains that one has to want Job Corps training and help for it to make a difference in one's life. The pamphlet explains that the center has classrooms, dormitories, cafeterias, recreational facilities, and offices and that the enrollee will be given clothing to wear and pay while at the center. The Job Corps offers training in 160 different jobs. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington D.C. 20402 Stock no. 029-000-00398-0; price: $1.75.

The National Apprenticeship Program points out that "apprentices are employed in every major industry—construction, health, manufacturing, service, and other fields. Young people considering apprenticeship have the opportunity to choose from among more than 700 occupations, with training periods varying from 1 to 6 years." This 32-page booklet describes what apprenticeship is, what apprenticeship can do, how to apply for an apprenticeship, where apprentices are employed, how to register an apprenticeship program, and other matters of concern to potential apprentices or those who would start an apprenticeship program. Available, free, from the Bureau of Apprenticeship and Training, U.S. Department of Labor, Washington, D.C. 20213, any State apprenticeship agency, or any local or regional Bureau of Apprenticeship and Training office.

Occupational Projections and Training Data, 1980 Edition, Bulletin 2052, is a concise, comprehensive statistical guide to the job market for more than 200 occupations. It includes the statistics that underlie the *Occupational Outlook Handbook* and is organized around the same 13 major job clusters for easy use. It provides (1) education and training requirements; (2) 1978 and projected 1990 employment; (3) annual openings arising from industry growth and replacement needs; (4) available data on how many people completed education and training programs for each occupation. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock no. 029-001-02512-2; price: $4.75.

A Counselor's Guide to Occupational Information, Bulletin 2042, is a 60-page, annotated catalog of career information available from Federal agencies. The listings include materials on occupational information; special categories of work—such as summer jobs—special groups in the labor force; apprenticeship, education, and financial aid; job search; career education; and statistics. The most recent items listed were published in the summer of 1979. Older material is included if it is still considered useful. Available from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. Stock no. 029-001-02490-8; price: $3.50.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1980 O— 311-407 /11

Your Bureau of Labor Statistics Regional Office Is Equipped to:

- Help you find the information you need about prices, employment, wages, occupational outlook, fringe benefits, earnings, and other current statistical series.
- Explain what the data mean to your region, your industry, your labor market.
- Help you use the data correctly.
- Deliver the information promptly.

Bureau of Labor Statistics Regional Offices

Region I
1603 JFK Federal Building
Government Center
Boston, Massachusetts 02203
Phone: 223-6761 (Area Code 617)

Region II
Suite 3400
1515 Broadway
New York, New York 10036
Phone: 399-5405 (Area Code 212)

Region III
3535 Market Street
P.O. Box 13309
Philadelphia, Pennsylvania 19101
Phone: 596-1154 (Area Code 215)

Region IV
Suite 540
1371 Peachtree Street, N.E.
Atlanta, Georgia 30309
Phone: 881-4418 (Area Code 404)

Region V
9th Floor, 230 S. Dearborn Street
Chicago, Illinois 60604
Phone: 353-1880 (Area Code 312)

Region VI
Second Floor
555 Griffin Square Building
Dallas, Texas 75202
Phone: 749-3516 (Area Code 214)

Regions VII and VIII
Federal Office Building
911 Walnut Street, 15th Floor
Kansas City, Missouri 64106
Phone: 374-2481 (Area Code 816)

Regions IX and X
450 Golden Gate Avenue
Box 36017
San Francisco, California 94102
Phone: 556-4678 (Area Code 415)

U.S. Department of Labor
Bureau of Labor Statistics
Washington, D.C. 20212

Official Business
Penalty for Private Use, $300.

Postage and Fees Paid
U.S. Department of Labor
Lab-441

SECOND CLASS MAIL

OOQ SERIA300SAISSDUE002R 1
SERIALS PROCESSING
UNIVERSITY MICROFILMS INTL
300 N ZEEB RD
ANN ARBOR MI 48106

Job Outlook Projections:
Why Do Them?
How Are They Made?
How Accurate Are They?

See page 2.